

**REMOVAL ASSESSMENT REPORT  
FOR  
UTAH METAL SMELTER  
SALT LAKE CITY, SALT LAKE COUNTY, UTAH**

Prepared for:

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**  
Region 8  
1595 Wynkoop Street  
Denver, Colorado 80202

Prepared by:

**WESTON SOLUTIONS, INC.**  
1435 Garrison Street, Suite 100  
Lakewood, Colorado 80215

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WESTON START Project Manager	David Robinson
U.S. EPA On-Scene Coordinator	Martin McComb

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May 2013

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## 1. INTRODUCTION

The U.S. Environmental Protection Agency (U.S. EPA) tasked the Weston Solutions, Inc. (WESTON®), Superfund Technical Assessment and Response Team (START) to assist U.S. EPA On-Scene Coordinator (OSC) Martin McComb in performing a removal assessment at the Utah Metal Smelter Site in Salt Lake City, Salt Lake County, Utah (the Site; Figure 1). Under Technical Direction Document (TDD) No. 1402-01, U.S. EPA requested that WESTON START document the impact of an historical smelter on the soil of the residential and public properties on the Site. During the week of April 14, 2014, WESTON START, with the assistance of Utah Department of Environmental Quality (DEQ) personnel, conducted a removal assessment under the direction of OSC McComb. Property owners granted site access and present at the Site during the removal assessment.

This removal assessment report is organized into the following sections:

- **Introduction** – Provides a brief description of the objective and scope of removal assessment activities
- **Site Background** – Details the Site description and its known history
- **Removal Assessment Activities** – Discusses removal assessment observations and activities
- **Conclusions** – Summarizes the removal assessment findings and recommendations for further activities at the Site as needed.

## 2. SITE BACKGROUND

### 2.1 SITE DESCRIPTION

The Site is located in Salt Lake City, Utah and includes the property which historically hosted a smelter and the surrounding residential and public properties (Figure 1). The properties which encompass the site are summarized in Table 1. The site was divided into 25 zones. The zones represent residential properties, Park Grove Elementary School, and a Salt Lake City Greenway. Two of the residential zones (15 and 20) were not sampled because access was not granted. One of the elementary school zones (22) was not sampled because it did not have accessible soil; soil was covered in gravel, geotextile fabric, and wood chips. Zone 26 was added in Poplar Grove Park, located approximately 0.4 miles north of the site, to represent background metals concentrations.

### 2.2 SITE HISTORY

Utah Metal Works was established at 1155 Hayes Ave in Salt Lake City, Utah as a specialty metal smelter and refinery. Company operations were concerned with the production of electrotype and linotype printing alloys, including lead, zinc, Babbitt metal, and specialty metal mixtures.

Refining and smelting occurred on-site from 1926 to 1956. In 1956 the company was purchased and moved to northern Salt Lake City, Utah. Six to seven homes were built on the Hayes Avenue former smelter property in 1966.

USEPA determined that the potential exists for soil contamination on the site. The main contaminants of concern are heavy metals, specifically lead and arsenic.

### 3. REMOVAL ASSESSMENT ACTIVITIES

During the week of April 14, 2014 U.S. EPA OSC Martin McComb and WESTON START met with the property owners at the Site to conduct the removal assessments. The removal assessment had the following objectives:

- Assess and evaluate suspected contaminants
- Determine if a removal action is warranted at the Site

Removal activities at the site were conducted in accordance with the approved Sampling and Analysis Plan. For each sampling zone defined by the OSC, START collected three five-point composite samples. The samples represented the following sampling depths: 0 to 6 inches, 6 to 18 inches, and 18 to 36 inches. Surface soil samples (0 to 6 inch depth interval) were collected with decontaminated shovels and stainless steel scoops. Subsurface soil samples (6 to 18 and 18 to 36 inch depth intervals) were either collected using a hand auger or a Geoprobe® direct push system, depending on property access conditions.

Aliquots were homogenized and composited into a single sample per sampling zone, per depth interval. Samples were then placed in zip-top bags and transferred to the on-site Environmental Services Assistance Team (ESAT) laboratory where samples were prepared and analyzed for Target Analyte List (TAL) metals by X-Ray Fluorescence (XRF).

Each property was assigned a Property ID; which consisted of between one and five zones. Sampling data was documented in a Scribe mobile application form on an iPad and entered into a site-specific Scribe database for data management and reporting purposes. The Scribe database was published to Scribe.net to allow for incorporation into EPA's geospatial viewer. A latitude and longitude was recorded at each sampling zone from the central-most aliquot to allow for visual representation of sampling activities on EPA's geospatial viewer. Sampling activities were also photo documented. Photo documentation is presented in Appendix B.

START sampled 23 zones and collected a total of 76 samples, including 7 field duplicates. Table 2 summarizes the samples (including QA samples) collected in each sampling zone. All samples were analyzed for total metals by XRF at the field laboratory. Ten percent of the samples were submitted for confirmation analysis at the ESAT laboratory in Golden Colorado via EPA method 6010B. The confirmation analysis concluded that XRF results were suitable for decision-making. Laboratory confirmation results and data correlation with the on-site XRF data are presented in Appendix C. Lead and arsenic concentrations were compared to the EPA Regional Screening Levels (RSLs) for residential soils.

The results of sampling indicated three zones, Zone 23, Zone 21, and Zone 06, contained lead and arsenic concentrations in excess of the action limits at multiple depths. One sample from Zone showed arsenic concentration in excess of the action limit. The XRF analytical results and RSLs are presented in Table 3. Lead results at each depth interval for all locations are presented in Figures 3 through 5.

Additional zones showed arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within background concentrations observed in the background sample. The XRF results from the background samples are presented in Table 4. Only concentrations exceeding background levels were considered as above the action limit.

EPA has determined removal action is required in Zones 23, Zone 21, and Zone 06. Removal action will not be pursued in Zone 02.

#### 4. CONCLUSIONS

The removal assessment determined that the following sampling zones did have metals concentrations in excess of site action limits:

- Zone 23 (Property ID (b) (6)),
- Zone 21 (Property ID (b) (6)) and
- Zone 06 (Property ID 931 Emery).

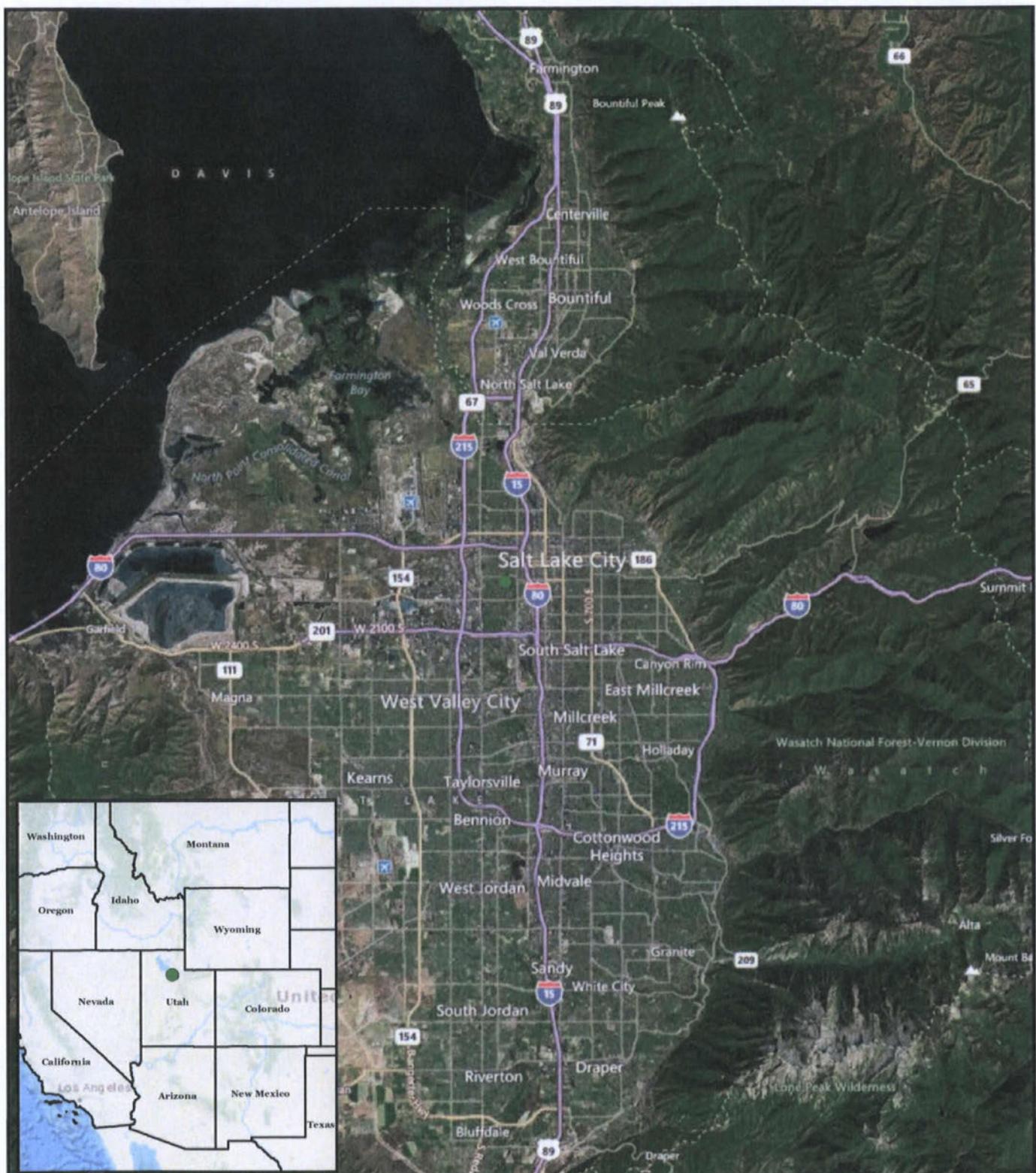
The removal assessment determined that the remaining properties assessed did not have any metals concentrations in excess of site action limits and no further action is required or planned.

Contaminants and conditions at the Site meet criteria established for a time-critical removal action by the U.S. EPA. The time-critical removal action is necessary to mitigate imminent and substantial endangerment posed to human health, human welfare, and the environment by Site conditions.

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**FIGURES**

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### Legend

- Site Location

0 10,500 1,000 42,000 Feet



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**FIGURE 1**  
**SITE LOCATION MAP**  
**UTAH METAL SMELTER**  
**SALT LAKE CITY, UTAH**  
**SALT LAKE COUNTY**

Date: 3/5/2014



### Legend

- Former Smelter Area
- Surrounding Parcels

0 140 280 560 Feet



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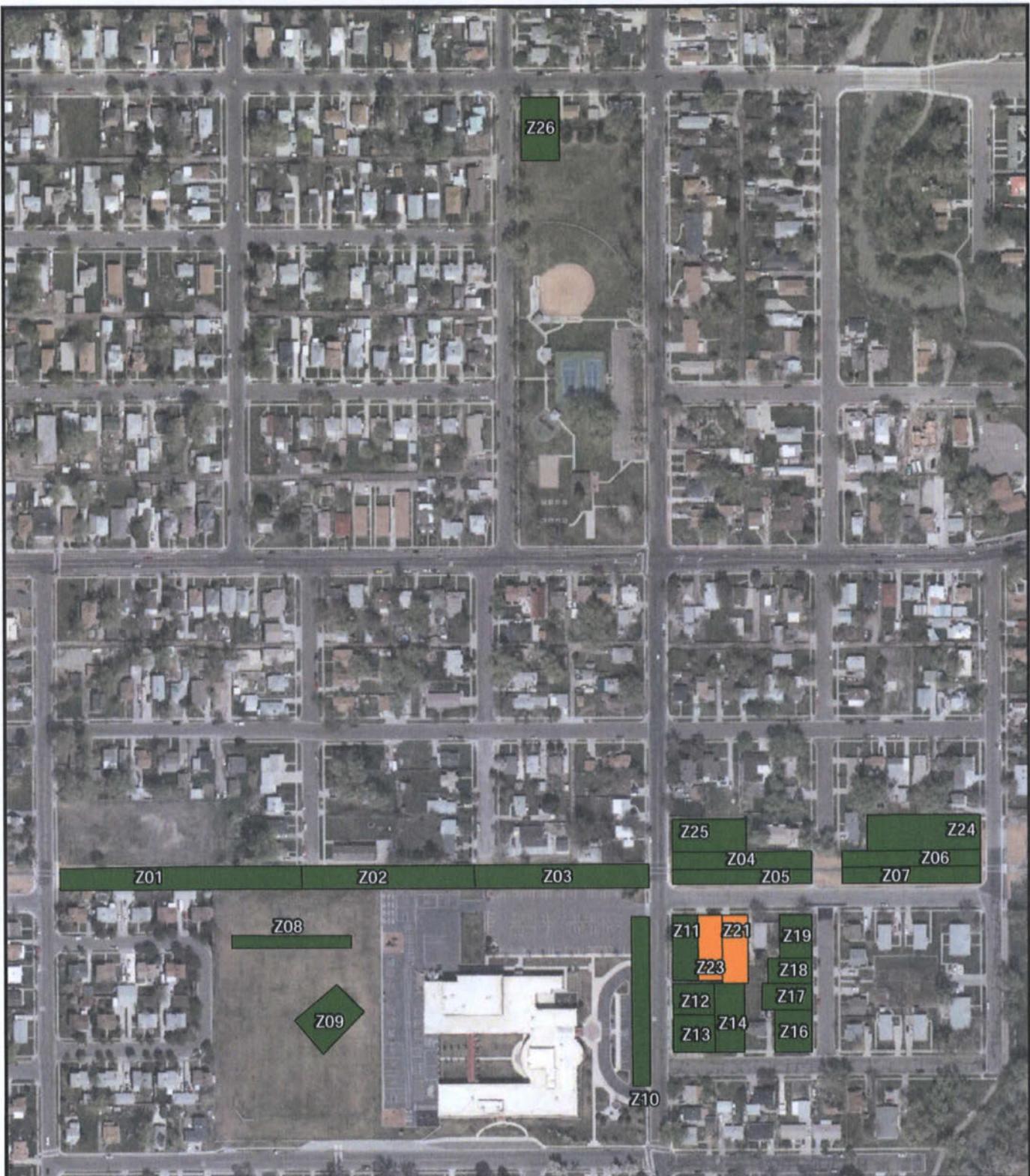
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**FIGURE 2**  
**SITE VICINITY MAP**  
**UTAH METAL SMELTER**  
**SALT LAKE CITY, UTAH**  
**SALT LAKE COUNTY**

Date: 3/11/2014



**Legend**  
**Lead Results**

- [Dark Green Box] < 400
- [Yellow Box] 400 - 1000
- [Orange Box] 1000 - 5000
- [Red Box] > 5000

0 140 280

560 Feet



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**FIGURE 3**  
**LEAD DETECTIONS**  
**0 - 6 INCHES**  
**UTAH METAL SMELTER**  
**SALT LAKE CITY, UTAH**  
**SALT LAKE COUNTY**

Date: 5/15/2014



**Legend  
Lead Results**

- [Dark Green Box] < 400
- [Yellow Box] 400 - 1000
- [Orange Box] 1000 - 5000
- [Red Box] > 5000

560 Feet

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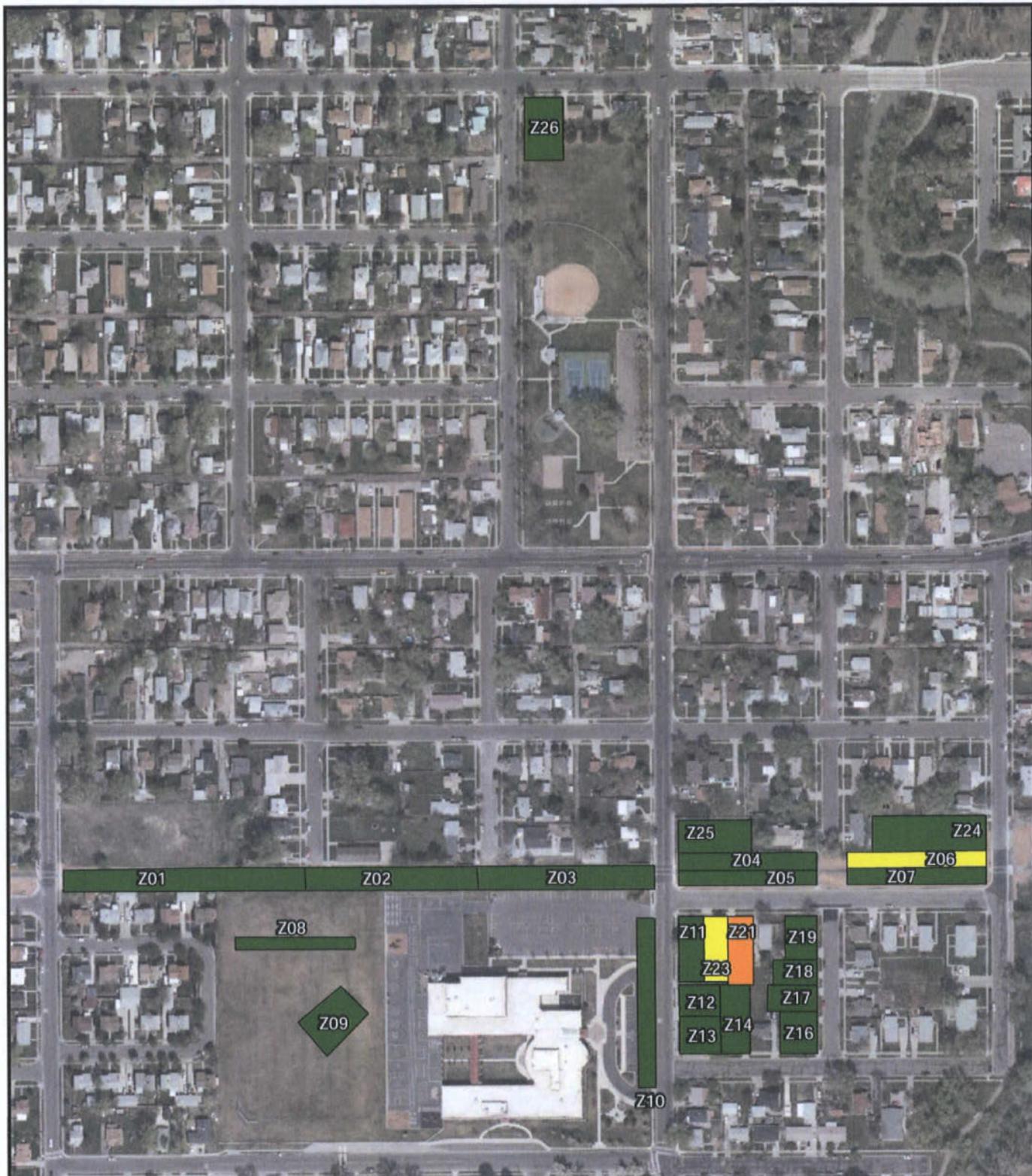
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**FIGURE 4  
LEAD DETECTIONS  
6 - 18 INCHES  
UTAH METAL SMELTER  
SALT LAKE CITY, UTAH  
SALT LAKE COUNTY**

Date: 5/15/2014



**Legend**  
**Lead Results**

- [Dark Green] < 400
- [Yellow] 400 - 1000
- [Orange] 1000 - 5000
- [Red] > 5000

0 140 280 560 Feet



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**FIGURE 4**  
**LEAD DETECTIONS**  
**18 - 36 INCHES**  
**UTAH METAL SMELTER**  
**SALT LAKE CITY, UTAH**  
**SALT LAKE COUNTY**

Date: 5/15/2014

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**TABLES**

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**Table 1: Property Information**

Property ID	Property Type	Address	City	State	Zip	Property Access
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Refused
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Refused
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
915 Navjo	Greenway	915 Navjo St.	Salt Lake City	Utah	84104	Signed
931 Emery	Greenway	931 S. Emery St.	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
970 Emery	School	970 S. Emery St.	Salt Lake City	Utah	84104	Signed
(b) (6)	Resident	(b) (6)	Salt Lake City	Utah	84104	Signed
Background	Public	Poplar Grove Park	Salt Lake City	Utah	84104	Signed

**Table 2: Sample Summary**

<b>Property ID</b>	<b>Zone</b>	<b>Samples</b>
915 Navajo	Z01	USZ01D01_041414, USZ01D02_041414, <b>USZ01D02D_041414</b> , USZ01D03_041414, <b>USZ01D03D_041414</b>
915 Navajo	Z02	USZ02D01_041414, USZ02D02_041414, USZ02D03_041414
915 Navajo	Z03	USZ03D01_041414, USZ03D02_041414, USZ03D03_041414
931 Emery	Z04	USZ04D01_041414, USZ04D02_041414, USZ04D03_041414
931 Emery	Z05	USZ05D01_041414, USZ05D02_041414, USZ05D03_041414
931 Emery	Z06	USZ06D01_041414, USZ06D02_041414, USZ06D03_041414
931 Emery	Z07	USZ07D01_041414, USZ07D02_041414, USZ07D03_041414
931 Emery	Z24	USZ24D01_041614, USZ24D02_041614, USZ24D03_041614
931 Emery	Z25	USZ25D01_041614, USZ25D02_041614, USZ25D03_041614
970 Emery	Z08	USZ08D01_041414, USZ08D02_041514, USZ08D03_041514
970 Emery	Z09	USZ09D01_041414, USZ09D02_041514, USZ09D03_041514
970 Emery	Z10	USZ10D01_041414, USZ10D02_041514, USZ10D03_041514
(b) (6)	Z11	USZ11D01_041514, <b>USZ11D01D_041514</b> , USZ11D02_041514, <b>USZ11D02D_041514</b> , USZ11D03_041514, <b>USZ11D03D_041514</b>
(b) (6)	Z23	USZ23D01_041514, USZ23D02_041514, USZ23D03_041514
(b) (6)	Z12	USZ12D01_041514, USZ12D02_041514, USZ12D03_041514
(b) (6)	Z13	USZ13D01_041614, USZ13D02_041614, <b>USZ13D02D_041614</b> , USZ13D03_041614,
(b) (6)	Z14	USZ14D01_041514, USZ14D02_041514, USZ14D03_041514
(b) (6)	Z16	USZ16D01_041614, USZ16D02_041614, USZ16D03_041614
(b) (6)	Z17	USZ17D01_041514, USZ17D02_041514, USZ17D03_041514
(b) (6)	Z18	USZ18D01_041414, USZ18D02_041414, USZ18D03_041414
(b) (6)	Z19	USZ19D01_041614, USZ19D02_041614, USZ19D03_041614
(b) (6)	Z21	USZ21D01_041414, USZ21D02_041414, USZ21D03_041414
Background	Z26	USZ26D01_041614, USZ26D02_041614, USZ26D03_041614, <b>USZ26D03D_041614</b>

Table 3: XRF Data Summary

Sample ID	Analyte and Result (ppm)														
	Arsenic	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Rubidium	Selenium	Strontium	Zinc	Zirconium
EPA Residential Soil Regional Screening Level (ppm)	0.61*	NA	2.3	310	5500*	400	180*	1	39	150	NA	39	4700	2300	0.63*
USZ01D01_041414	16 J	275 U	698 U	66 U	4327 U	82	460 U	5 U	17 U	46 U	97	5 U	439	200	597
USZ01D02_041414	23 J	275 U	698 U	66 U	1434 J	37	460 U	5 U	17 U	46 U	121	5 U	510	58 J	482
USZ01D02D_041414	17 J	275 U	698 U	66 U	4327 U	30 J	460 U	5 U	17 U	46 U	113	5 U	470	50 J	576
USZ01D03_041414	20 J	275 U	698 U	66 U	1438 J	31 J	460 U	5 U	17 U	46 U	124	5 U	488	77	534
USZ01D03D_041414	18 J	275 U	698 U	66 U	1427 J	17 J	460 U	5 U	17 U	46 U	124	5 U	452	39 J	512
USZ02D01_041414	14 J	275 U	698 U	66 U	4327 U	30 J	460 U	5 U	17 U	46 U	98	5 U	549	45 J	423
USZ02D02_041414	42	275 U	698 U	66 U	1530 J	36	460 U	5 U	17 U	46 U	126	5 U	517	42 J	543
USZ02D03_041414	14 J	275 U	698 U	66 U	1514 J	24 J	460 U	5 U	17 U	46 U	131	5 U	476	68 U	532
USZ03D01_041414	18 J	275 U	698 U	66 U	4327 U	26 J	460 U	5 U	17 U	46 U	117	5 U	500	44 J	439
USZ03D02_041414	25 J	275 U	698 U	66 U	1472 J	35	460 U	5 U	17 U	46 U	117	5 U	495	42 J	581
USZ03D03_041414	16 J	275 U	698 U	66 U	4327 U	12 J	460 U	5 U	17 U	46 U	113	5 U	514	68 U	522
USZ04D01_041414	17 J	275 U	698 U	66 U	4327 U	47	460 U	5 U	17 U	46 U	89	5 U	456	73	396
USZ04D01D_041414	68 U	848 U	2091 U	2656 U	145034 U	1454 U	1904 U	5 U	117 U	339 U	100 J	5 U	437 J	2196 U	500 J
USZ04D02_041414	19 J	275 U	698 U	66 U	4327 U	40	460 U	5 U	17 U	46 U	106	5 U	549	62 J	440
USZ04D03_041414	24 J	275 U	698 U	66 U	4327 U	12 J	460 U	5 U	17 U	46 U	98	5 U	675	68 U	435
USZ05D01_041414	24 J	275 U	272 J	57 J	15398	99	260 J	5 U	17 U	46 U	74	5 U	302	384	260
USZ05D02_041414	16 J	275 U	308 J	61 J	18726	92	524	5 U	17 U	46 U	78	5 U	330	354	329
USZ05D03_041414	28 U	275 U	698 U	27 J	11708	24 J	250 J	5 U	17 U	46 U	60	5 U	402	62 J	233
USZ06D01_041414	11 J	275 U	698 U	66 U	4327 U	20 J	460 U	5 U	17 U	46 U	96	5 U	466	43 J	421
USZ06D02_041414	39	275 U	698 U	728	1513 J	500	460 U	5 U	41	46 U	103	5 U	509	539	431
USZ06D03_041414	28 U	275 U	698 U	1170	4327 U	680	460 U	5 U	17 U	46 U	72	12 J	489	1172	379
USZ07D01_041414	15 J	275 U	698 U	66 U	4327 U	33 J	460 U	5 U	17 U	46 U	99	5 U	578	50 J	441
USZ07D02_041414	28 U	275 U	698 U	66 U	4327 U	37	460 U	5 U	17 U	46 U	111	5 U	590	46 J	474
USZ07D03_041414	17 J	275 U	698 U	66 U	4327 U	24 J	460 U	5 U	17 U	46 U	113	5 U	655	30 J	474
USZ08D01_041414	13 J	275 U	238 J	35 J	15708	44	289 J	5 U	17 U	46 U	74	5 U	281	81	326
USZ08D02_041514	28 U	275 U	698 U	43 J	17261	69	425 J	5 U	10 J	46 U	72	5 U	260	91	359
USZ08D03_041514	28 U	275 U	698 U	50 J	15959	71	362 J	5 U	17 U	46 U	65	5 U	231	86	278
USZ09D01_041414	10 J	275 U	239 J	28 J	16184	28 J	343 J	5 U	17 U	46 U	69	5 U	308	68	363
USZ09D02_041514	28 U	275 U	698 U	51 J	17558	77	393 J	5 U	17 U	46 U	78	5 U	290	134	329
USZ09D03_041514	10 J	275 U	224 J	66 U	15248	33 J	394 J	5 U	17 U	46 U	69	5 U	216	56 J	307
USZ10D01_041414	18 J	275 U	698 U	57 J	16223	66	308 J	5 U	10 J	46 U	81	5 U	267	217	303
USZ10D02_041514	16 J	275 U	698 U	75	16912	77	394 J	5 U	17 U	46 U	83	5 U	289	183	313

Table 3: XRF Data Summary

Sample ID	Analyte and Result (ppm)														
	Arsenic	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Rubidium	Selenium	Strontium	Zinc	Zirconium
EPA Residential Soil Regional Screening Level (ppm)	0.61*	NA	2.3	310	5500*	400	180*	1	39	150	NA	39	4700	2300	0.63*
USZ10D03_041514	28 U	275 U	698 U	71	15766	52	356 J	5 U	17 U	46 U	76	5 U	335	107	322
USZ11D01_041514	28 U	275 U	224 J	267	18624	375	486	24 J	17 U	46 U	87	5 U	309	366	362
USZ11D01D_041514	28 U	275 U	234 J	525	18528	335	371 J	59 J	17 U	46 U	85	5 U	316	305	345
USZ11D02_041514	28 U	275 U	219 J	70	18204	111	447 J	5 U	17 U	46 U	89	5 U	296	124	338
USZ11D02D_041514	14 J	275 U	294 J	61 J	18539	76	464	5 U	17 U	46 U	91	5 U	301	108	325
USZ11D03_041514	28 U	275 U	698 U	66 U	14156	31 J	219 J	5 U	17 U	46 U	79	5 U	381	50 J	281
USZ11D03D_041514	9 J	275 U	213 J	24 J	14467	22 J	247 J	5 U	17 U	46 U	74	5 U	402	53 J	279
USZ12D01_041514	28 U	275 U	230 J	42 J	19532	100	424 J	5 U	17 U	46 U	87	5 U	333	162	348
USZ12D02_041514	20 J	275 U	268 J	59 J	18075	140	475	5 U	17 U	46 U	81	5 U	312	629	405
USZ12D03_041514	17 J	275 U	221 J	66 U	16216	19 J	371 J	5 U	17 U	46 U	82	5 U	337	92	312
USZ13D01_041614	28 U	275 U	254 J	56 J	17693	77	328 J	5 U	17 U	46 U	78	5 U	314	97	335
USZ13D02_041614	28 U	275 U	211 J	46 J	17460	78	308 J	5 U	17 U	46 U	82	5 U	313	91	394
USZ13D02D_041614	28 U	275 U	698 U	51 J	16879	88	390 J	5 U	17 U	46 U	87	5 U	309	82	312
USZ13D03_041614	11 J	275 U	242 J	51 J	18285	43	439 J	5 U	17 U	46 U	87	5 U	319	79	351
USZ14D01_041514	28 U	275 U	222 J	81	16082	326	289 J	5 U	17 U	46 U	80	5 U	394	136	272
USZ14D02_041514	23 J	275 U	277 J	85	18132	202	388 J	5 U	17 U	46 U	82	5 U	367	124	319
USZ14D03_041514	13 J	275 U	213 J	52 J	16073	63	368 J	5 U	17 U	46 U	78	5 U	332	76	320
USZ16D01_041614	12 J	275 U	213 J	67	15398	98	276 J	5 U	17 U	46 U	74	5 U	329	101	266
USZ16D02_041614	28 U	275 U	698 U	35 J	18434	56	452 J	5 U	17 U	46 U	92	5 U	326	84	323
USZ16D03_041614	11 J	275 U	227 J	26 J	14591	30 J	265 J	5 U	17 U	46 U	75	5 U	369	44 J	274
USZ17D01_041514	14 J	275 U	698 U	92	19239	66	427 J	5 U	17 U	46 U	85	5 U	322	109	331
USZ17D02_041514	13 J	275 U	698 U	46 J	16305	115	342 J	5 U	17 U	46 U	78	5 U	329	110	305
USZ17D03_041514	28 U	275 U	698 U	40 J	18473	40	372 J	5 U	17 U	46 U	86	5 U	318	83	326
USZ18D01_041414	28 U	275 U	235 J	123	20048	77	443 J	5 U	17 U	46 U	85	5 U	303	115	330
USZ18D02_041414	28 U	275 U	698 U	74	18103	159	390 J	5 U	17 U	46 U	80	5 U	336	110	281
USZ18D03_041414	19 J	275 U	698 U	33 J	17334	41	457 J	5 U	17 U	46 U	90	5 U	316	76	349
USZ19D01_041614	28 U	275 U	229 J	50 J	17560	109	298 J	5 U	17 U	46 U	82	5 U	316	94	402
USZ19D02_041614	18 J	275 U	226 J	54 J	17405	115	448 J	5 U	17 U	46 U	78	5 U	296	114	273
USZ19D03_041614	18 J	275 U	279 J	24 J	18806	31 J	397 J	5 U	17 U	46 U	89	5 U	320	71	424
USZ21D01_041414	28 U	275 U	251 J	1120	19473	3718	385 J	5 U	17 U	46 U	83	5 U	323	1670	344
USZ21D01_041514	28 U	275 U	274 J	976	18740	3515	385 J	5 U	17 U	46 U	75	5 U	321	1586	338
USZ21D02_041414	116	291	374 J	2072	24070	6981	476	5 U	17 U	46 U	80	5 U	351	2562	363

Table 3: XRF Data Summary

Sample ID	Analyte and Result (ppm)														
	Arsenic	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Rubidium	Selenium	Strontium	Zinc	Zirconium
EPA Residential Soil Regional Screening Level (ppm)	0.61*	NA	2.3	310	5500*	400	180*	1	39	150	NA	39	4700	2300	0.63*
USZ21D02_041514	163	272 J	234 J	2138	24841	6875	465	5 U	17 U	46 U	85	5 U	348	2488	369
USZ21D03_041414	28 U	275 U	318 J	1281	20670	2550	408 J	5 U	17 U	46 U	79	5 U	318	960	381
USZ23D01_041514	48	275 U	311 J	696	19603	1289	392 J	5 U	17 U	46 U	76	5 U	292	1966	333
USZ23D02_041514	28 U	275 U	698 U	105	18304	813	318 J	5 U	17 U	46 U	73	5 U	354	160	295
USZ23D03_041514	46	275 U	262 J	615	18656	896	426 J	5 U	17 U	46 U	83	5 U	322	855	353
USZ24D01_041614	28 U	140 J	213 J	208	18044	151	378 J	5 U	17 U	46 U	83	5 U	200	167	293
USZ24D02_041614	13 J	275 U	698 U	36 J	14728	41	387 J	5 U	17 U	46 U	75	5 U	212	79	290
USZ24D03_041614	11 J	275 U	698 U	39 J	14107	31 J	312 J	5 U	17 U	46 U	63	5 U	272	50 J	284
USZ25D01_041614	28 U	275 U	698 U	26 J	13306	40	297 J	5 U	17 U	46 U	64	5 U	176	57 J	326
USZ25D02_041614	28 U	275 U	698 U	33 J	18075	86	451 J	5 U	17 U	46 U	88	5 U	294	103	359
USZ25D03_041614	28 U	129 J	241 J	39 J	14657	56	334 J	5 U	17 U	46 U	80	5 U	364	59 J	278

ppm - parts per million

U - the analyte was not detected at the method detection limit

J - the analyte was detected between the method detection limit and the reporting limit and is therefore an estimated quantity

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

\* Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

Table 4: Background Sample XRF Data Summary

Sample ID	Analyte and Result (ppm)														
	Arsenic	Chromium	Cobalt	Copper	Iron	Lead	Manganese	Mercury	Molybdenum	Nickel	Rubidium	Selenium	Strontium	Zinc	Zirconium
USZ26D01_041614	28 U	275 U	698 U	44 J	16313	81	327 J	5 U	17 U	46 U	81	5 U	325	76	334
USZ26D02_041614	12 J	275 U	295 J	51 J	18387	48	495	5 U	17 U	46 U	90	5 U	308	72	344
USZ26D03_041614	11 J	275 U	698 U	33 J	13497	25 J	293 J	5 U	17 U	46 U	69	5 U	369	58 J	319
USZ26D03D_041614	10 J	275 U	698 U	32 J	13648	28 J	249 J	5 U	17 U	46 U	75	5 U	378	50 J	275

ppm - parts per million

U - the analyte was not detected at the method detection limit

J - the analyte was detected between the method detection limit and the reporting limit and is therefore an estimated quantity

---

**APPENDIX A**  
**PROPERTY REPORTS**

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**REGION 8**  
1595 Wynkoop Street  
Denver, CO 80202-1129  
Phone 800-227-8917  
<http://www.epa.gov/region08>

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

(b) (6) [REDACTED]

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

Dear (b) (6),

The United States Environmental Protection Agency (EPA) completed an assessment of the soils at (b) (6) [REDACTED] on 4/16/2014. The purpose of EPA's investigation was to determine if this property has been adversely impacted by historic smelter activities in the area.

EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

All samples from this property were found to be below EPA's human health benchmarks. EPA plans no further actions on this property.

Thank you for participating in this investigation. We'll be removing soil from other properties in your neighborhood starting on May 19, 2014. I'll contact you to see if you have any questions.

Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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### Soil Analytical Data

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ16D01 _041614	USZ16D02 _041614	USZ16D03 _041614
Arsenic	0.61	12 J	28 U	11 J
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	213 J	698 U	227 J
Copper	310	67	35 J	26 J
Iron	5500	15398	18434	14591
Lead	400	98	56	30 J
Manganese	180	276 J	452 J	265 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	74	92	75
Selenium	39	5 U	5 U	5 U
Strontium	4700	329	326	369
Zinc	2300	101	84	44 J
Zirconium	0.63	266	323	274

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM Parts Per Million

NA Not applicable- no RSL available for the analyte

U The analyte was not detected above the detection limit of the method - which is the value listed with the U

J The analyte was detected between the detection limit and the reporting limit and is an estimated quantity



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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

(b) (6) [REDACTED]

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

Dear (b) (6) [REDACTED]

The United States Environmental Protection Agency (EPA) completed an assessment of the soils at (b) (6) [REDACTED] on 4/15/2014. The purpose of EPA's investigation was to determine if this property has been adversely impacted by historic smelter activities in the area.

EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

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Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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### Soil Analytical Data

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ14D01 _041514	USZ14D02 _041514	USZ14D03 _041514
Arsenic	0.61	28 U	23 J	13 J
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	222 J	277 J	213 J
Copper	310	81	85	52 J
Iron	5500	16082	18132	16073
Lead	400	326	202	63
Manganese	180	289 J	388 J	368 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	80	82	78
Selenium	39	5 U	5 U	5 U
Strontium	4700	394	367	332
Zinc	2300	136	124	76
Zirconium	0.63	272	319	320

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

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(b) (6) [REDACTED]

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

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EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

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Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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### Soil Analytical Data

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ19D01 _041614	USZ19D02 _041614	USZ19D03 _041614
Arsenic	0.61	28 U	18 J	18 J
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	229 J	226 J	279 J
Copper	310	50 J	54 J	24 J
Iron	5500	17560	17405	18806
Lead	400	109	115	31 J
Manganese	180	298 J	448 J	397 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	82	78	89
Selenium	39	5 U	5 U	5 U
Strontium	4700	316	296	320
Zinc	2300	94	114	71
Zirconium	0.63	402	273	424

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM Parts Per Million

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

(b) (6) [REDACTED]

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

Dear (b) (6) [REDACTED],

The United States Environmental Protection Agency (EPA) completed an assessment of the soils at (b) (6) [REDACTED] on 4/14/2014. The purpose of EPA's investigation was to determine if this property has been adversely impacted by historic smelter activities in the area.

EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

All samples from this property were found to be below EPA's human health benchmarks. EPA plans no further actions on this property.

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Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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**Soil Analytical Data**

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ18D01 _041414	USZ18D02 _041414	USZ18D03 _041414
Arsenic	0.61	28 U	28 U	19 J
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	235 J	698 U	698 U
Copper	310	123	74	33 J
Iron	5500	20048	18103	17334
Lead	400	77	159	41
Manganese	180	443 J	390 J	457 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	85	80	90
Selenium	39	5 U	5 U	5 U
Strontium	4700	303	336	316
Zinc	2300	115	110	76
Zirconium	0.63	330	281	349

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM                      Parts Per Million

NA                      Not applicable- no RSL available for the analyte

U                      The analyte was not detected above the detection limit of the method - which is the value listed with the U

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

(b) (6) [REDACTED]

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

Dear (b) (6),

The United States Environmental Protection Agency (EPA) completed an assessment of the soils at (b) (6) [REDACTED] on 4/15/2014. The purpose of EPA's investigation was to determine if this property has been adversely impacted by historic smelter activities in the area.

EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

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Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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**Soil Analytical Data**

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ17D01 _041514	USZ17D02 _041514	USZ17D03 _041514
Arsenic	0.61	14 J	13 J	28 U
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	698 U	698 U	698 U
Copper	310	92	46 J	40 J
Iron	5500	19239	16305	18473
Lead	400	66	115	40
Manganese	180	427 J	342 J	372 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	85	78	86
Selenium	39	5 U	5 U	5 U
Strontium	4700	322	329	318
Zinc	2300	109	110	83
Zirconium	0.63	331	305	326

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM Parts Per Million

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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

(b) (6) [REDACTED]

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

Dear (b) (6),

The United States Environmental Protection Agency (EPA) completed an assessment of the soils at (b) (6) [REDACTED] on 4/15/2014. The purpose of EPA's investigation was to determine if this property has been adversely impacted by historic smelter activities in the area.

EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

All samples from this property were found to be below EPA's human health benchmarks. EPA plans no further actions on this property.

Thank you for participating in this investigation. We'll be removing soil from other properties in your neighborhood starting on May 19, 2014. I'll contact you to see if you have any questions.

Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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**Soil Analytical Data**

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ12D01 _041514	USZ12D02 _041514	USZ12D03 _041514
Arsenic	0.61	28 U	20 J	17 J
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	230 J	268 J	221 J
Copper	310	42 J	59 J	66 U
Iron	5500	19532	18075	16216
Lead	400	100	140	19 J
Manganese	180	424 J	475	371 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	87	81	82
Selenium	39	5 U	5 U	5 U
Strontium	4700	333	312	337
Zinc	2300	162	629	92
Zirconium	0.63	348	405	312

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM                          Parts Per Million

NA                          Not applicable- no RSL available for the analyte

U                          The analyte was not detected above the detection limit of the method - which is the value listed with the U

J                          The analyte was detected between the detection limit and the reporting limit and is an estimated quantity



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Denver, CO 80202-1129  
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## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Mr. Gregg Smith  
Salt Lake City School District  
970 S Emery Street  
Salt Lake City, UT 84104

**Re: Soil Sampling Results**

5/13/2014

Dear Mr. Smith,

The United States Environmental Protection Agency (EPA) completed an assessment of the soils at 970 S Emery Street on 4/15/2014. The purpose of EPA's investigation was to determine if this property has been adversely impacted by historic smelter activities in the area.

EPA collected 9 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

All samples from this property were found to be below EPA's human health benchmarks. EPA plans no further actions on this property.

Thank you for participating in this investigation. We'll be removing soil from other properties in your neighborhood starting on May 19, 2014. I'll contact you to see if you have any questions.

Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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Soil Analytical Data  
970 Emery

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)									
		USZ08D01 _041414	USZ08D02 _041514	USZ08D03 _041514	USZ09D01 _041414	USZ09D02 _041514	USZ09D03 _041514	USZ10D01 _041414	USZ10D02 _041514	USZ10D03 _041514	
Arsenic	0.61	13 J	28 U	28 U	10 J	28 U	10 J	18 J	16 J	28 U	
Chromium	NA	275 U	275 U	275 U	275 U	275 U	275 U	275 U	275 U	275 U	
Cobalt	2.3	238 J	698 U	698 U	239 J	698 U	224 J	698 U	698 U	698 U	
Copper	310	35 J	43 J	50 J	28 J	51 J	66 U	57 J	75	71	
Iron	5500	15708	17261	15959	16184	17558	15248	16223	16912	15766	
Lead	400	44	69	71	28 J	77	33 J	66	77	52	
Manganese	180	289 J	425 J	362 J	343 J	393 J	394 J	308 J	394 J	356 J	
Mercury	1	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Molybdenum	39	17 U	10 J	17 U	17 U	17 U	17 U	10 J	17 U	17 U	
Nickel	150	46 U	46 U	46 U	46 U	46 U	46 U	46 U	46 U	46 U	
Rubidium	NA	74	72	65	69	78	69	81	83	76	
Selenium	39	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	
Strontium	4700	281	260	231	308	290	216	267	289	335	
Zinc	2300	81	91	86	68	134	56 J	217	183	107	
Zirconium	0.63	326	359	278	363	329	307	303	313	322	

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM

Parts Per Million

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Denver, CO 80202-1129  
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**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**

(b) (6)

Salt Lake City, UT 84104

Re: Soil Sampling Results

5/13/2014

Dear (b) (6),

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EPA collected 3 soil samples on the property. These samples were collected from three different depths (0-6", 6-18" and 18-36"). The samples were analyzed using field instrumentation and the results of these analyses were confirmed by secondary laboratory analysis. The final results associated with these samples are included with this correspondence.

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Thank you for participating in this investigation. We'll be removing soil from other properties in your neighborhood starting on May 19, 2014. I'll contact you to see if you have any questions.

Sincerely,

Martin McComb, On Scene Coordinator  
Emergency Response Program  
Environmental Protection Agency, Region 8



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## Soil Analytical Data

(b) (6)

Analyte	EPA Residential Soil Regional Screening Level (ppm)	Sample ID and Analytical Result (ppm)		
		USZ13D01 _041614	USZ13D02 _041614	USZ13D03 _041614
Arsenic	0.61	28 U	28 U	11 J
Chromium	NA	275 U	275 U	275 U
Cobalt	2.3	254 J	211 J	242 J
Copper	310	56 J	46 J	51 J
Iron	5500	17693	17460	18285
Lead	400	77	78	43
Manganese	180	328 J	308 J	439 J
Mercury	1	5 U	5 U	5 U
Molybdenum	39	17 U	17 U	17 U
Nickel	150	46 U	46 U	46 U
Rubidium	NA	78	82	87
Selenium	39	5 U	5 U	5 U
Strontium	4700	314	313	319
Zinc	2300	97	91	79
Zirconium	0.63	335	394	351

Shading indicates the analyte was detected at concentrations higher than the EPA Residential Soil Screening Level

Please note - while arsenic, iron, manganese and zirconium levels are higher than the RSL, the majority of exceedances are within normal background levels. Only concentrations exceeding background levels are shaded

PPM

Parts Per Million

NA

Not applicable- no RSL available for the analyte

U

The analyte was not detected above the detection limit of the method - which is the value listed with the U

J

The analyte was detected between the detection limit and the reporting limit and is an estimated quantity

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**APPENDIX B**  
**PHOTOGRAPHIC DOCUMENTATION**

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**PHOTO 1**

START4 personnel collect surface soil aliquot with decontaminated tools.



**PHOTO 2**

Example of soil cores from five aliquots.



**PHOTO 3**

Zones 1, 2, and 3 (Property ID 915 Navajo) facing west.



**PHOTO 4**

START4 and EPA personnel collect samples in Zone 18 (Property ID(b) (6)).



**PHOTO 5**  
EPA personnel collect samples in Zone 21 (Property ID (b) (6)).



**PHOTO 6**  
START personnel hand auger aliquot and composite sample in zone 14 (Property ID  
(b) (6)).



**PHOTO 7**

START personnel collect sample using geoprobe in Zone 12 (Property ID (b) (6)).



**PHOTO 8**

EPA personnel collects surface sample in zone 17 (Property ID (b) (6)).



**PHOTO 9**  
Geoprobe in place to collect sample in Zone 23 (Property ID (b) (6)).



**PHOTO 10**  
START personnel operate geoprobe in Zone 23 (Property ID (b) (6)).



**PHOTO 11**  
Soil cores from Zone 23 (Property ID (b) (6)).



**PHOTO 12**  
START personnel operate geoprobe in Zone 10 (Property ID 970 Emery).



**PHOTO 13**  
Sampling Zone 08 representing soccer fields (Property ID 970 Emery).



**PHOTO 14**  
START personnel operate geoprobe in Zone 13 (Property ID (b) (6)).



**PHOTO 15**  
START personnel operate geoprobe in Zone 16 (Property ID (b) (6)).



**PHOTO 16**  
START personnel hand auger in Zone 16 (Property ID (b) (6)).



**PHOTO 17**  
START personnel hand auger in Zone 19 (Property ID (b) (6)).



**PHOTO 18**  
START personnel hand auger in Zone 26 (background location).

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**APPENDIX C**  
**LABORATORY CONFIRMATION SAMPLES AND CORRELATION**

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U.S. Environmental Protection Agency  
Region 8  
Technical and Management Services

Laboratory Services Program

Certificate of Analysis: Preliminary Report

Ref: 8TMS-L

MEMORANDUM

Date: 05/01/14

Subject: Analytical Results--- Utah Metal Smelter\_Soil\_APRApril 2014\_A032 / A-032

From: Don Goodrich; EPA Region 8 Analytical Chemistry WAM

To: Martin McComb  
Superfund  
1595 Wynkoop Street

Received Sample Set(s), [Work Order : Date Received]:

[ C140405 : 04/22/2014 ]

Attached are the analytical results for the samples received from the Utah Metal Smelter\_Soil\_APRApril 2014\_A032 sampling event, according to TDF A-032. All analyses were performed within their method specified holding times unless otherwise noted in the following narrative.

These samples were prepared, analyzed, and verified by the Environmental Services Assistance Team Laboratory (ESAT) according to the requirements of the Technical Direction Form (TDF).

Note: The laboratory herewith transmits this deliverable to the program/project partner for determination of "final data usability" which may include data validation and data quality assessment per and in accordance with EPA QA/G-8, *Guidance on Environmental Data Verification and Data Validation*, November 2002, EPA/240/R-02/004. Laboratory data qualifiers are applied based on the *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*, October 2004, referred to as "NFGI".

Laboratory policy is to dispose of any remaining sample 60 days after data analysis packages are delivered to EPA. If you would like the laboratory to retain the samples for a period longer than 60 days, please contact Don Goodrich within the 60 day period at (303) 312-6687.

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

### **Case Narrative**

**C140405**

**Quality Assessment:** Unless indicated by exception, the QA/QC associated with this sample set produced data within the TDF-specified criteria.

**Holding Times:** All samples were analyzed within their method-specified technical holding time(s).

1. Initial and Continuing calibration blanks (ICBs and CCBs).  
Exceptions: None.
2. Preparation (PB) / Method blanks (MB)  
Exceptions: None.
3. Interference Checks (ICSA / ICSAB) for ICP-MS and ICP-OE analyses only.  
Exceptions: None.
4. Initial and Continuing calibration verification analyses (ICVs, SCVs and CCVs).  
Exceptions: None.
5. Laboratory Control Sample (LCS) or second source analysis or SRM.  
Exceptions: In ICP-OE batch 1404035, selenium recovered high in the SRM. No qualifiers were assigned since there were no selenium detections.
6. Laboratory Fortified blank (LFB) / Blank spike (BS), same source as used for the matrix spikes.  
PBS performed with analyses/methods requiring preparation or digestion prior to analysis.  
Exceptions: None.
7. Contract Reporting Detection Limit Standard, labeled as CRA, CRDL or CRL.  
Exceptions: None.
8. Laboratory Duplicate (DUP). "Source" identifies field sample duplicated in the laboratory. If either the "source" or the duplicate result is <5X the reporting limit, the %D limit of 20% does not apply.  
Exceptions: None.
9. Laboratory Matrix Spike (MS) and spike duplicate (MSD). "Source" defines original field sample fortified prior to analysis. Percent recovery (%R) limits do not apply when sample concentration(s) exceed the corresponding analyte spike level by a factor of 4 or greater.  
Exceptions: None.
10. Serial Dilution sample analysis (SRD). "Source" is parent field sample diluted 1:5 in the laboratory. Performed for ICP-OE and ICP-MS metals analyses. Percent difference (%D) limits do not apply when analyte concentration(s) are below 50x the source sample's MDL (or 10x it's PQL).  
Exceptions: None.
11. Internal standards, criteria specified for ICP-MS analyses only, monitored at the instrument.  
Exceptions: None.
12. Any calibration using more than two-points produced a correlation coefficient equal to or greater than 0.995.  
Exceptions: None.

**Project Name:** Utah Metal Smelter\_Soil\_APR.2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**Acronyms and Definitions:**

ESAT	Environmental Services Assistance Team
J	Data Estimated qualifier (also applied to all data less than PQL, greater than or equal to MDL)
MDL	Method Detection Limit
PQL	Practical Quantitation Limit, also known as reporting limit.
RPD	Relative Percent Difference (difference divided by the mean)
%D	Percent difference, serial dilution criteria unit, difference divided by the original result.
%R	Percent recovery, analyzed (less sample contribution) divided by true value
<	Analyte NOT DETECTED at or above the Method Detection Limit (MDL)
mg/L	Parts per million (milligrams per liter). Solids equivalent = mg/Kg.
ug/L	Parts per billion (micrograms per liter). Solids equivalent = ug/Kg.
NR	No Recovery (matrix spike) - Often seen for calcium/magnesium when their concentration exceeds the spike level by > 4x.
NFGI	USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
RE	Sample Re-analysis. Usually seen on raw data and sequences for required sample dilutions due to over-range analytes.
U	Analyte not detected at or above MDL qualifier
D	Diluted value qualifier.

**Method(s) Summary:**

As defined in the Technical Direction Form (TDF), some or all of the methods listed below were used for the determination of the reported target analytes.

From EPA's *Methods for the Determination of Metals in Environmental Samples*, Supplement I, May 1994, dissolved, total, and/or total recoverable metals were determined by:

- Method 200.7 / 6010B using a PE Optim a ICP -OE (ICP).
- Method 200.8 / 6020 using a Perkin -Elmer Elan 6000 ICP-MS.
- Method 200.2 for total recoverable metals (only) digestion.
- Method 245.1 using a Perkin -Elmer FIMS CVAA (aqueous mercury only).

From *Standard Methods for the Examination of Water and Wastewater*, 18<sup>th</sup> Edition, 1992, Method 2340B was used for the calculated hardness determination. Hardness is reported as mg (milligram) equivalent CaCO<sub>3</sub> per liter (L) determined as follows:

$$\text{Calculated hardness} = 2.497 * (\text{Calcium, mg/L}) + 4.118 * (\text{Magnesium, mg/L}).$$

From EPA's *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, SW -846,

- Method 3015A was used for microwave assisted total metals digestion.
- Method 7473 was used for mercury in solids .

From EPA's *Determination of Inorganic Anions by Ion Chromatography*, Revision 2.1, 1993, Method 300.0 was used to determine the anions.

From EPA's *Methods for Chemical Analysis of Water and Wastes*, March 1983:

- Method 310.1 was followed for the alkalinity determination.
- Method 160.1 was followed for gravimetric total dissolved solids (TDS) determination.
- Method 160.2 was used for gravimetric total suspended solids (TSS) determination.
- Method 415.3 was used for total organic carbon (TOC) determination using either an Apollo 9000 or Phoenix 8000 Non-Dispersive IR (NDIR) system. Also known as dissolved organic carbon (DOC) when performed on the dissolved sample fraction.

The quality control procedures listed in the TDF request were utilized by ESAT to verify accuracy of the results and to evaluate any matrix interferences.

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ03D03\_041414      **Date / Time Sampled:** 04/14/14 14:45  
**EPA Tag No.:** 8-A      **Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	7250		mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 102	U	mg/kg dry wt	50.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 102	U	mg/kg dry wt	60.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	98.5		mg/kg dry wt	1.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 5.08	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 5.08	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	27100		mg/kg dry wt	102	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	9.06		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.56		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	24.4		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	11000		mg/kg dry wt	102	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	17.4	J	mg/kg dry wt	10.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	6820		mg/kg dry wt	102	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	338		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	10.7		mg/kg dry wt	5.08	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	3150		mg/kg dry wt	254	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 102	U	mg/kg dry wt	60.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 10.2	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 1020	U	mg/kg dry wt	254	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	57.1		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.3	U	mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	11.5	J	mg/kg dry wt	10.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	60.4		mg/kg dry wt	10.2	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ04D02_041414	<b>Date / Time Sampled:</b> 04/14/14 10:45	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-02 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	6800		mg/kg dry wt	19.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 98.7	U	mg/kg dry wt	49.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 98.7	U	mg/kg dry wt	59.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	117		mg/kg dry wt	0.987	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.93	U	mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 4.93	U	mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	34500		mg/kg dry wt	98.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	9.04		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.45		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	46.2		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	11000		mg/kg dry wt	98.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	87.8		mg/kg dry wt	9.87	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	8370		mg/kg dry wt	98.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	299		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	11.5		mg/kg dry wt	4.93	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2860		mg/kg dry wt	247	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 98.7	U	mg/kg dry wt	59.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 9.87	U	mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 987	U	mg/kg dry wt	247	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	89.5		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.7	U	mg/kg dry wt	19.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	11.0	J	mg/kg dry wt	9.87	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	214		mg/kg dry wt	9.87	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

## **Certificate of Analysis: Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ05D01\_041414      **Date / Time Sampled:** 04/14/14 09:50      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	5550		mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 98.9	U	mg/kg dry wt	49.5	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 98.9	U	mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	91.7		mg/kg dry wt	0.989	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.95	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 4.95	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	47100		mg/kg dry wt	98.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	10.3		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.31		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	55.7		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	10700		mg/kg dry wt	98.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	99.1		mg/kg dry wt	9.89	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	13300		mg/kg dry wt	98.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	299		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	11.3		mg/kg dry wt	4.95	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2210		mg/kg dry wt	247	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 98.9	U	mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 9.89	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 989	U	mg/kg dry wt	247	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	88.4		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.8	U	mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	13.5	J	mg/kg dry wt	9.89	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	424		mg/kg dry wt	9.89	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

## **Certificate of Analysis: Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ06D02\_041414      **Date / Time Sampled:** 04/14/14 11:30      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-04 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	10100		mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 101	U	mg/kg dry wt	50.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 101	U	mg/kg dry wt	60.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	1550		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 5.07	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	3.76	J	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	37800		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	29.2		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.50		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	3590		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	12800		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	1300		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	11200		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	282		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	51.0		mg/kg dry wt	5.07	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	1980		mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 101	U	mg/kg dry wt	60.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	7.13	J	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 1010	U	mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	86.2		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.3	U	mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	< 50.7	U	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	1450		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ06D03\_041414  
**EPA Tag No.:** 8-A

**Date / Time Sampled:** 04/14/14 11:40  
**Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-05 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	29700		mg/kg dry wt	20.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 99.9	U	mg/kg dry wt	49.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 99.9	U	mg/kg dry wt	59.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	1790		mg/kg dry wt	0.999	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.99	U	mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	7.51		mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	64600		mg/kg dry wt	99.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	95.1		mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.61		mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	5410		mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	10700		mg/kg dry wt	99.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	1740		mg/kg dry wt	9.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	15600		mg/kg dry wt	99.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	288		mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	80.6		mg/kg dry wt	4.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	1600		mg/kg dry wt	250	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 99.9	U	mg/kg dry wt	59.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	9.49	J	mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	428	J	mg/kg dry wt	250	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	131		mg/kg dry wt	2.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.0	U	mg/kg dry wt	20.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	11.3	J	mg/kg dry wt	9.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	2910		mg/kg dry wt	9.99	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT:USZ11D01\_041514      **Date / Time Sampled:** 04/15/14 09:20      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-06 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	<b>Aluminum</b>	<b>7360</b>		mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Antimony</b>	< 101	U	mg/kg dry wt	50.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Arsenic</b>	< 101	U	mg/kg dry wt	60.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Barium</b>	<b>154</b>		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Beryllium</b>	< 5.03	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cadmium</b>	<b>4.17</b>	J	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Calcium</b>	<b>22100</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Chromium</b>	<b>11.7</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cobalt</b>	<b>5.86</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Copper</b>	<b>356</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Iron</b>	<b>11300</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Lead</b>	<b>358</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Magnesium</b>	<b>7810</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Manganese</b>	<b>351</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Nickel</b>	<b>14.1</b>		mg/kg dry wt	5.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Potassium</b>	<b>3570</b>		mg/kg dry wt	251	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Selenium</b>	< 101	U	mg/kg dry wt	60.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Silver</b>	< 10.1	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Sodium</b>	< 1010	U	mg/kg dry wt	251	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Strontium</b>	<b>73.1</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Thallium</b>	< 20.1	U	mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Vanadium</b>	<b>12.4</b>	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Zinc</b>	<b>336</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

## **Certificate of Analysis: Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ12D02\_041514      **Date / Time Sampled:** 04/15/14 15:10      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-07 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	6800		mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 101	U	mg/kg dry wt	50.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 101	U	mg/kg dry wt	60.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	178		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 5.04	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 5.04	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	27600		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	11.4		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	4.85	J	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	49.7		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	11100		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	123		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	9500		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	349		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	12.0		mg/kg dry wt	5.04	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2440		mg/kg dry wt	252	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 101	U	mg/kg dry wt	60.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 10.1	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 1010	U	mg/kg dry wt	252	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	70.3		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.1	U	mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	14.2	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	636		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ13D02_041614	<b>Date / Time Sampled:</b> 04/16/14 11:40	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-08 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	<b>Aluminum</b>	7260		mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Antimony</b>	< 101	U	mg/kg dry wt	50.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Arsenic</b>	< 101	U	mg/kg dry wt	60.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Barium</b>	108		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Beryllium</b>	< 5.07	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cadmium</b>	< 5.07	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Calcium</b>	32800		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Chromium</b>	10.7		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cobalt</b>	5.31		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Copper</b>	43.8		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Iron</b>	10900		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Lead</b>	59.1		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Magnesium</b>	8590		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Manganese</b>	327		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Nickel</b>	13.8		mg/kg dry wt	5.07	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Potassium</b>	2810		mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Selenium</b>	< 101	U	mg/kg dry wt	60.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Silver</b>	< 10.1	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Sodium</b>	< 1010	U	mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Strontium</b>	91.1		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Thallium</b>	< 20.3	U	mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Vanadium</b>	12.9	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Zinc</b>	74.0		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

## **Certificate of Analysis: Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ14D01\_041514      **Date / Time Sampled:** 04/15/14 16:00      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-09 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	6830		mg/kg dry wt	20.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 101	U	mg/kg dry wt	50.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 101	U	mg/kg dry wt	60.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	112		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 5.06	U	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 5.06	U	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	51300		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	14.8		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.03	J	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	66.9		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	9770		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	271		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	8570		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	288		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	13.7		mg/kg dry wt	5.06	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2630		mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 101	U	mg/kg dry wt	60.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 10.1	U	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 1010	U	mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	192		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.2	U	mg/kg dry wt	20.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	21.4	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	127		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ14D02\_041514      **Date / Time Sampled:** 04/15/14 16:05  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Workorder:** C140405  
**Lab Number:** C140405-10      **A**

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
EPA 200.2/200.7	<b>Aluminum</b>	7370		mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Antimony</b>	< 99.2	U	mg/kg dry wt	49.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Arsenic</b>	< 99.2	U	mg/kg dry wt	59.5	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Barium</b>	110		mg/kg dry wt	0.992	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Beryllium</b>	< 4.96	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cadmium</b>	< 4.96	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Calcium</b>	39600		mg/kg dry wt	99.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Chromium</b>	12.7		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cobalt</b>	4.71	J	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Copper</b>	50.4		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Iron</b>	10400		mg/kg dry wt	99.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Lead</b>	202		mg/kg dry wt	9.92	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Magnesium</b>	8250		mg/kg dry wt	99.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Manganese</b>	338		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Nickel</b>	14.7		mg/kg dry wt	4.96	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Potassium</b>	2760		mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Selenium</b>	< 99.2	U	mg/kg dry wt	59.5	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Silver</b>	< 9.92	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Sodium</b>	252	J	mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Strontium</b>	137		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Thallium</b>	< 19.8	U	mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Vanadium</b>	16.3	J	mg/kg dry wt	9.92	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Zinc</b>	103		mg/kg dry wt	9.92	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ14D03\_041514      **Date / Time Sampled:** 04/15/14 16:10      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-11 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	6790		mg/kg dry wt	19.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 98.6	U	mg/kg dry wt	49.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 98.6	U	mg/kg dry wt	59.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	101		mg/kg dry wt	0.986	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.93	U	mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 4.93	U	mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	39000		mg/kg dry wt	98.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	11.4		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.04		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	28.1		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	10400		mg/kg dry wt	98.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	47.2		mg/kg dry wt	9.86	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	8320		mg/kg dry wt	98.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	309		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	11.3		mg/kg dry wt	4.93	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2620		mg/kg dry wt	246	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 98.6	U	mg/kg dry wt	59.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 9.86	U	mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 986	U	mg/kg dry wt	246	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	93.0		mg/kg dry wt	1.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.7	U	mg/kg dry wt	19.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	11.4	J	mg/kg dry wt	9.86	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	61.5		mg/kg dry wt	9.86	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_AP<sup>R</sup> 2014\_A032  
**TDF #:** A-032

## **Certificate of Analysis: Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ17D02\_041514      **Date / Time Sampled:** 04/15/14 13:55      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-12 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution-Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	6470		mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 100	U	mg/kg dry wt	50.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 100	U	mg/kg dry wt	60.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	93.3		mg/kg dry wt	1.00	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 5.02	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 5.02	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	30800		mg/kg dry wt	100	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	10.4		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.03		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	42.2		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	9960		mg/kg dry wt	100	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	89.2		mg/kg dry wt	10.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	7840		mg/kg dry wt	100	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	318		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	12.0		mg/kg dry wt	5.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2440		mg/kg dry wt	251	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 100	U	mg/kg dry wt	60.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 10.0	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 1000	U	mg/kg dry wt	251	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	89.9		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.1	U	mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	13.2	J	mg/kg dry wt	10.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	93.9		mg/kg dry wt	10.0	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ18D02\_041414  
**EPA Tag No.:** 8-A

**Date / Time Sampled:** 04/14/14 16:40  
**Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-13 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
EPA 200.2/200.7	<b>Aluminum</b>	<b>6250</b>		mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Antimony</b>	< 101	U	mg/kg dry wt	50.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Arsenic</b>	< 101	U	mg/kg dry wt	60.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Barium</b>	<b>103</b>		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Beryllium</b>	< 5.03	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cadmium</b>	< 5.03	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Calcium</b>	<b>34700</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Chromium</b>	<b>11.6</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cobalt</b>	<b>5.29</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Copper</b>	<b>51.8</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Iron</b>	<b>10300</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Lead</b>	<b>148</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Magnesium</b>	<b>9100</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Manganese</b>	<b>309</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Nickel</b>	<b>11.3</b>		mg/kg dry wt	5.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Potassium</b>	<b>2480</b>		mg/kg dry wt	251	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Selenium</b>	< 101	U	mg/kg dry wt	60.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Silver</b>	< 10.1	U	mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Sodium</b>	< 1010	U	mg/kg dry wt	251	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Strontium</b>	<b>85.2</b>		mg/kg dry wt	2.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Thallium</b>	< 20.1	U	mg/kg dry wt	20.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Vanadium</b>	<b>10.4</b>	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Zinc</b>	<b>86.0</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ19D01_041614	<b>Date / Time Sampled:</b> 04/16/14 15:00	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-14 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
EPA 200.2/200.7	<b>Aluminum</b>	<b>7250</b>		mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Antimony</b>	< 101	U	mg/kg dry wt	50.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Arsenic</b>	< 101	U	mg/kg dry wt	60.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Barium</b>	<b>120</b>		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Beryllium</b>	< 5.07	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cadmium</b>	< 5.07	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Calcium</b>	<b>40500</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Chromium</b>	<b>12.8</b>		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cobalt</b>	<b>4.91</b>	J	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Copper</b>	<b>43.9</b>		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Iron</b>	<b>10300</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Lead</b>	<b>93.2</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Magnesium</b>	<b>7780</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Manganese</b>	<b>328</b>		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Nickel</b>	<b>13.8</b>		mg/kg dry wt	5.07	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Potassium</b>	<b>2980</b>		mg/kg dry wt	254	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Selenium</b>	< 101	U	mg/kg dry wt	60.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Silver</b>	< 10.1	U	mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Sodium</b>	< 1010	U	mg/kg dry wt	254	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Strontium</b>	<b>119</b>		mg/kg dry wt	2.03	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Thallium</b>	< 20.3	U	mg/kg dry wt	20.3	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Vanadium</b>	<b>12.0</b>	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Zinc</b>	<b>100</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ21D01_041414	<b>Date / Time Sampled:</b> 04/14/14 15:15	<b>Workorder:</b> CI40405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-15 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	7200		mg/kg dry wt	20.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	79.2	J	mg/kg dry wt	50.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 101	U	mg/kg dry wt	60.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	191		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 5.06	U	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	66.6		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	35600		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	12.0		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.35		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	930		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	10300		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	4140		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	7250		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	295		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	16.0		mg/kg dry wt	5.06	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2400		mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 101	U	mg/kg dry wt	60.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 10.1	U	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 1010	U	mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	110		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 20.2	U	mg/kg dry wt	20.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	10.9	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	1610		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ21D02\_041414      **Date / Time Sampled:** 04/14/14 15:45      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-16 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	10500		mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	125		mg/kg dry wt	49.5	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 99.0		mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	238		mg/kg dry wt	0.990	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.95		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	33.9		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	21700		mg/kg dry wt	99.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	16.7		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.55		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	1500		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	12300		mg/kg dry wt	99.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	9220		mg/kg dry wt	9.90	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	6310		mg/kg dry wt	99.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	352		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	18.5		mg/kg dry wt	4.95	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2550		mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 99.0		mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	4.23	J	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 990		mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	92.3		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.8		mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	< 49.5		mg/kg dry wt	9.90	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	2040		mg/kg dry wt	9.90	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

## **Certificate of Analysis: Preliminary Report**

## **DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

**Station ID:** DRAFT: USZ21D03\_041414      **Date / Time Sampled:** 04/14/14 16:06      **Workorder:** C140405  
**EPA Tag No.:** 8-A      **Matrix:** Soil      **Lab Number:** C140405-17 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	10300		mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	67.2	J	mg/kg dry wt	49.5	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 99.0	U	mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	193		mg/kg dry wt	0.990	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.95	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	11.2		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	23800		mg/kg dry wt	99.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	13.9		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.25		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	1280		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	11500		mg/kg dry wt	99.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	3440		mg/kg dry wt	9.90	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	6330		mg/kg dry wt	99.0	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	338		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	18.0		mg/kg dry wt	4.95	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2800		mg/kg dry wt	247	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 99.0	U	mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 9.90	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 990	U	mg/kg dry wt	247	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	70.9		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.8	U	mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	< 49.5	U	mg/kg dry wt	9.90	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	1070		mg/kg dry wt	9.90	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ23D01_041514	<b>Date / Time Sampled:</b> 04/15/14 08:30	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-18 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
EPA 200.2/200.7	<b>Aluminum</b>	<b>7640</b>		mg/kg dry wt	20.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Antimony</b>	<b>&lt; 101</b>	U	mg/kg dry wt	50.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Arsenic</b>	<b>&lt; 101</b>	U	mg/kg dry wt	60.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Barium</b>	<b>199</b>		mg/kg dry wt	1.01	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Beryllium</b>	<b>&lt; 5.06</b>	U	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cadmium</b>	<b>19.2</b>		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Calcium</b>	<b>23500</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Chromium</b>	<b>18.7</b>		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Cobalt</b>	<b>5.30</b>		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Copper</b>	<b>643</b>		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Iron</b>	<b>10800</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Lead</b>	<b>1650</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Magnesium</b>	<b>6550</b>		mg/kg dry wt	101	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Manganese</b>	<b>296</b>		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Nickel</b>	<b>15.6</b>		mg/kg dry wt	5.06	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Potassium</b>	<b>2650</b>		mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Selenium</b>	<b>&lt; 101</b>	U	mg/kg dry wt	60.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Silver</b>	<b>3.00</b>	J	mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Sodium</b>	<b>258</b>	J	mg/kg dry wt	253	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Strontium</b>	<b>75.8</b>		mg/kg dry wt	2.02	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Thallium</b>	<b>&lt; 20.2</b>	U	mg/kg dry wt	20.2	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Vanadium</b>	<b>13.6</b>	J	mg/kg dry wt	10.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	<b>Zinc</b>	<b>2070</b>		mg/kg dry wt	10.1	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ23D02_041514	<b>Date / Time Sampled:</b> 04/15/14 08:45	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-19 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	7370		mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 99.1	U	mg/kg dry wt	49.5	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 99.1	U	mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	148		mg/kg dry wt	0.991	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.95	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	< 4.95	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	41200		mg/kg dry wt	99.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	9.44		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.41		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	108		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	11200		mg/kg dry wt	99.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	1260		mg/kg dry wt	9.91	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	8700		mg/kg dry wt	99.1	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	289		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	11.0		mg/kg dry wt	4.95	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2880		mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 99.1	U	mg/kg dry wt	59.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 9.91	U	mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	369	J	mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	120		mg/kg dry wt	1.98	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.8	U	mg/kg dry wt	19.8	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	< 49.5	U	mg/kg dry wt	9.91	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	156		mg/kg dry wt	9.91	10	04/24/2014	SV	1404035

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods**

<b>Station ID:</b> DRAFT: USZ23D03_041514	<b>Date / Time Sampled:</b> 04/15/14 09:00	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-20 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
EPA 200.2/200.7	Aluminum	8280		mg/kg dry wt	19.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Antimony	< 99.4	U	mg/kg dry wt	49.7	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Arsenic	< 99.4	U	mg/kg dry wt	59.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Barium	153		mg/kg dry wt	0.994	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Beryllium	< 4.97	U	mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cadmium	9.48		mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Calcium	18800		mg/kg dry wt	99.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Chromium	10.7		mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Cobalt	5.06		mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Copper	438		mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Iron	11000		mg/kg dry wt	99.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Lead	1030		mg/kg dry wt	9.94	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Magnesium	6850		mg/kg dry wt	99.4	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Manganese	333		mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Nickel	15.1		mg/kg dry wt	4.97	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Potassium	2880		mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Selenium	< 99.4	U	mg/kg dry wt	59.6	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Silver	< 9.94	U	mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Sodium	< 994	U	mg/kg dry wt	248	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Strontium	67.5		mg/kg dry wt	1.99	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Thallium	< 19.9	U	mg/kg dry wt	19.9	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Vanadium	< 49.7	U	mg/kg dry wt	9.94	10	04/24/2014	SV	1404035
EPA 200.2/200.7	Zinc	768		mg/kg dry wt	9.94	10	04/24/2014	SV	1404035

"J" Qualifier indicates an estimated value

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

**Station ID:** DRAFT: USZ03D03\_041414      **Date / Time Sampled:** 04/14/14 14:45  
**EPA Tag No.:** 8-A      **Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-01 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	< 0.021	U	mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

**Station ID:** DRAFT: USZ04D02\_041414      **Date / Time Sampled:** 04/14/14 10:45  
**EPA Tag No.:** 8-A      **Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-02 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.039		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

**Station ID:** DRAFT: USZ05D01\_041414      **Date / Time Sampled:** 04/14/14 09:50  
**EPA Tag No.:** 8-A      **Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-03 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.248		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

**Station ID:** DRAFT: USZ06D02\_041414      **Date / Time Sampled:** 04/14/14 11:30  
**EPA Tag No.:** 8-A      **Matrix:** Soil

**Workorder:** C140405  
**Lab Number:** C140405-04 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.579		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF#:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ06D03_041414	<b>Date / Time Sampled:</b> 04/14/14 11:40	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-05 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.820		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ11D01_041514	<b>Date / Time Sampled:</b> 04/15/14 09:20	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-06 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	13.34		mg/kg dry wt	0.155	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ12D02_041514	<b>Date / Time Sampled:</b> 04/15/14 15:10	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-07 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.072		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ13D02_041614	<b>Date / Time Sampled:</b> 04/16/14 11:40	<b>Workorder:</b> C140405
<b>EPA Tag No.:</b> 8-A	<b>Matrix:</b> Soil	<b>Lab Number:</b> C140405-08 A

<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.046		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**Project Name:** Utah Metal Smelter\_Soil\_AP2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

Station ID: DRAFT: USZ14D01_041514	Date / Time Sampled: 04/15/14 16:00	Workorder: C140405
EPA Tag No.: 8-A	Matrix: Soil	Lab Number: C140405-09 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.160		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

Station ID: DRAFT: USZ14D02_041514	Date / Time Sampled: 04/15/14 16:05	Workorder: C140405
EPA Tag No.: 8-A	Matrix: Soil	Lab Number: C140405-10 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.118		mg/kg dry wt	0.011	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

Station ID: DRAFT: USZ14D03_041514	Date / Time Sampled: 04/15/14 16:10	Workorder: C140405
EPA Tag No.: 8-A	Matrix: Soil	Lab Number: C140405-11 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.035		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

Station ID: DRAFT: USZ17D02_041514	Date / Time Sampled: 04/15/14 13:55	Workorder: C140405
EPA Tag No.: 8-A	Matrix: Soil	Lab Number: C140405-12 A

Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.047		mg/kg dry wt	0.011	1	04/30/2014	NP	1404045

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ18D02_041414 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/14/14 16:40 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-13 A
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Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.069		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ19D01_041614 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/16/14 15:00 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-14 A
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Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.059		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ21D01_041414 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/14/14 15:15 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-15 A
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Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.413		mg/kg dry wt	0.011	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ21D02_041414 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/14/14 15:45 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-16 A
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Method	Parameter	Results	Qualifier	Units	MDL	Dilution Factor	Analyzed	By	Batch
7473	Mercury	0.839		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

**Certificate of Analysis:**  
**Preliminary Report**

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ21D03_041414 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/14/14 16:06 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-17 A
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<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.321		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ23D01_041514 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/15/14 08:30 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-18 A
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<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.386		mg/kg dry wt	0.011	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ23D02_041514 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/15/14 08:45 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-19 A
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<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.134		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method**

<b>Station ID:</b> DRAFT: USZ23D03_041514 <b>EPA Tag No.:</b> 8-A	<b>Date / Time Sampled:</b> 04/15/14 09:00 <b>Matrix:</b> Soil	<b>Workorder:</b> C140405 <b>Lab Number:</b> C140405-20 A
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<b>Method</b>	<b>Parameter</b>	<b>Results</b>	<b>Qualifier</b>	<b>Units</b>	<b>MDL</b>	<b>Dilution Factor</b>	<b>Analyzed</b>	<b>By</b>	<b>Batch</b>
7473	Mercury	0.163		mg/kg dry wt	0.010	1	04/30/2014	NP	1404045

"J" Qualifier indicates an estimated value

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

**Certificate of Analysis:  
Preliminary Report**

**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control****TechLaw, Inc. - ESAT Region 8**

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit							
<b>ICPOE - PE Optima</b>																
Batch 1404035 - 200.2 - TR Metals																
<i>Soil</i>																
<b>Method Blank (1404035-BLK1)</b>																
Dilution Factor: 1																
Silver	< 2.00	10.0	mg/kg dry wt													
Aluminum	< 20.0	50.0	"													
Arsenic	< 60.0	100	"													
Barium	< 1.00	5.00	"													
Beryllium	< 2.00	5.00	"													
Calcium	< 100	250	"													
Cadmium	< 2.00	5.00	"													
Cobalt	< 2.00	5.00	"													
Chromium	< 2.00	5.00	"													
Copper	< 2.00	2.00	"													
Iron	102.45	250	"													
Potassium	304.99	1000	"													
Magnesium	< 100	250	"													
Manganese	< 2.00	5.00	"													
Sodium	< 250	1000	"													
Nickel	< 5.00	10.0	"													
Lead	< 10.0	25.0	"													
Antimony	< 50.0	100	"													
Selenium	< 60.0	100	"													
Thallium	< 20.0	20.0	"													
Vanadium	< 10.0	50.0	"													
Zinc	< 10.0	20.0	"													
Strontium	< 2.00	10.0	"													
<b>Duplicate (1404035-DUP1)</b>																
Dilution Factor: 1																
Source: C140405-01																
Prepared: 04/22/14 Analyzed: 04/24/14																
Silver	< 2.00	9.99	mg/kg dry wt													
Aluminum	7438.3	50.0	"													
Arsenic	< 60.0	99.9	"													
Barium	97.060	5.00	"													
Beryllium	< 2.00	5.00	"													
Calcium	27525	250	"													
Cadmium	< 2.00	5.00	"													
Cobalt	5.2342	5.00	"													
Chromium	9.1128	5.00	"													
Copper	23.653	2.00	"													
Iron	11211	250	"													
Potassium	3172.1	999	"													
Magnesium	6957.8	250	"													
Manganese	329.66	5.00	"													
Sodium	< 250	999	"													
									35							
								3	35							
								1	35							
								1	35							
								6	35							
								0.6	35							
								3	35							
								2	35							
								0.8	35							
								2	35							
								2	35							
									35							

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
**TDF #:** A-032

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**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control**  
TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
<b>Batch 1404035 - 200.2 - TR Metals</b>									
<i>Soil</i>									
<b>Duplicate (1404035-DUP1)</b>		Dilution Factor: 1		<b>Source: C140405-01</b>				<b>Prepared: 04/22/14 Analyzed: 04/24/14</b>	
Nickel	10.586	9.99	mg/kg dry wt		10.667			0.8	35
Lead	19.702	25.0	"		17.406			12	35
Antimony	< 50.0	99.9	"		< 50.0				35
Selenium	< 60.0	99.9	"		< 60.0				35
Thallium	< 20.0	20.0	"		< 20.0				35
Vanadium	10.065	50.0	"		11.505			13	35
Zinc	58.572	20.0	"		60.356			3	35
Strontium	56.673	9.99	"		57.121			0.8	35
<b>Matrix Spike (1404035-MS1)</b>		Dilution Factor: 1		<b>Source: C140405-01</b>				<b>Prepared: 04/22/14 Analyzed: 04/24/14</b>	
Silver	9.0945	9.88	mg/kg dry wt	7.41	< 1.98	123	70-130		
Aluminum	7983.7	49.4	"	198	7248.1	372	70-130		
Arsenic	78.361	98.8	"	79.1	< 59.3	99	70-130		
Barium	120.18	4.94	"	19.8	98.476	110	70-130		
Beryllium	20.769	4.94	"	19.8	< 1.98	105	70-130		
Calcium	27295	247	"	98.8	27142	155	70-130		
Cadmium	21.189	4.94	"	19.8	< 1.98	107	70-130		
Cobalt	26.232	4.94	"	19.8	5.5614	105	70-130		
Chromium	50.223	4.94	"	39.5	9.0619	104	70-130		
Copper	53.458	1.98	"	29.7	24.398	98	70-130		
Iron	11661	247	"	297	11036	211	70-130		
Potassium	4209.5	988	"	988	3145.4	108	70-130		
Magnesium	7192.0	247	"	198	6818.6	189	70-130		
Manganese	360.83	4.94	"	19.8	338.00	116	70-130		
Sodium	500.39	988	"	297	< 247	169	70-130		
Nickel	63.552	9.88	"	49.4	10.667	107	70-130		
Lead	120.55	24.7	"	98.8	17.406	104	70-130		
Antimony	< 49.4	98.8	"	79.1	< 49.4		70-130		
Selenium	209.30	98.8	"	198	< 59.3	106	70-130		
Thallium	204.33	19.8	"	198	< 19.8	103	70-130		
Vanadium	41.754	49.4	"	29.7	11.505	102	70-130		
Zinc	79.337	19.8	"	19.8	60.356	96	70-130		
Strontium	78.109	9.88	"	19.8	57.121	106	70-130		

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032  
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**DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control**  
**TechLaw, Inc. - ESAT Region 8**

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
<b>Batch 1404035 - 200.2 - TR Metals</b>									
<b>Matrix Spike (1404035-MS3)</b>		Dilution Factor: 1		<b>Soil</b>			<b>ICPOE - PE Optima</b>		
Silver	8.4410	9.95	mg/kg dry wt	7.46	< 1.99	113	70-130		
Aluminum	7291.2	49.8	"	199	6798.8	247	70-130		
Arsenic	97.923	99.5	"	79.6	< 59.7	123	70-130		
Barium	139.15	4.98	"	19.9	116.89	112	70-130		
Beryllium	20.463	4.98	"	19.9	< 1.99	103	70-130		
Calcium	34562	249	"	99.5	34485	78	70-130		
Cadmium	21.411	4.98	"	19.9	< 1.99	108	70-130		
Cobalt	25.523	4.98	"	19.9	5.4527	101	70-130		
Chromium	49.447	4.98	"	39.8	9.0427	101	70-130		
Copper	73.915	1.99	"	29.9	46.168	93	70-130		
Iron	11416	249	"	299	10987	143	70-130		
Potassium	3877.1	995	"	995	2862.9	102	70-130		
Magnesium	8636.0	249	"	199	8368.4	134	70-130		
Manganese	316.37	4.98	"	19.9	299.26	86	70-130		
Sodium	533.88	995	"	299	<.249	179	70-130		
Nickel	62.842	9.95	"	49.8	11.469	103	70-130		
Lead	196.58	24.9	"	99.5	87.843	109	70-130		
Antimony	< 49.8	99.5	"	79.6	< 49.8		70-130		
Selenium	206.80	99.5	"	199	< 59.7	104	70-130		
Thallium	206.19	19.9	"	199	< 19.9	104	70-130		
Vanadium	39.850	49.8	"	29.9	11.035	97	70-130		
Zinc	237.28	19.9	"	19.9	214.38	115	70-130		
Strontium	109.91	9.95	"	19.9	89.530	102	70-130		
<b>Reference (1404035-SRM1)</b>		Dilution Factor: 1		Prepared: 04/22/14 Analyzed: 04/24/14					
Silver	24.626	19.6	mg/kg dry wt	20.9		118	64-136		
Aluminum	295.64	97.8	"	309		96	63-137		
Arsenic	873.87	196	"	930		94	65-134		
Barium	3.1141	9.78	"	5.30		59	48-152		
Beryllium	20.006	9.78	"	18.8		106	82-118		
Calcium	180370	489	"	184000		98	78-122		
Cadmium	44.298	9.78	"	41.6		106	77-123		
Cobalt	143.20	9.78	"	140		102	80-120		
Chromium	105.73	9.78	"	96.5		110	80-120		
Copper	6453.7	3.91	"	6680		97	80-120		
Iron	20463	489	"	21000		97	80-120		
Potassium	< 489	1960	"	102			0-370		
Magnesium	107120	489	"	113000		95	80-120		
Manganese	208.03	9.78	"	201		103	80-120		
Sodium	< 489	1960	"	92.8			0-299		
Nickel	63.616	19.6	"	56.8		112	76.5-123.4		

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

Certificate of Analysis:  
Preliminary Report

## DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods - Quality Control

TechLaw, Inc. - ESAT Region 8

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
<b>Batch 1404035 - 200.2 - TR Metals</b>									
<i>Soil</i>									
<b>ICPOE - PE Optima</b>									
Reference (1404035-SRM1)		Dilution Factor: 1							
Lead	221.31	48.9	mg/kg dry wt	224	99	75-125			
Antimony	255.02	196	"	213	120	61-139			
Selenium	< 117	196	"	37.0		48-152			
Thallium	49.398	39.1	"	38.1	130	64.5-135			
Vanadium	66.852	97.8	"	65.8	102	80-120			
Zinc	171.35	39.1	"	175	98	73-127			
<b>Batch 1404038 - 1404035</b>									
<i>Soil</i>									
<b>ICPOE - PE Optima</b>									
Serial Dilution (1404038-SRD1)		Dilution Factor: 5		Source: C140405-01					
Silver	< 10.2	50.8	mg/kg dry wt	< 2.04					10
Aluminum	7357.3	254	"	7248.1		1			10
Arsenic	< 305	508	"	< 61.00					10
Barium	99.678	25.4	"	98.476		1			10
Beryllium	< 10.2	25.4	"	< 2.04					10
Calcium	27450	1270	"	27142		1			10
Cadmium	< 10.2	25.4	"	< 2.04					10
Cobalt	< 10.2	25.4	"	5.5614					10
Chromium	10.247	25.4	"	9.0619		12			10
Copper	27.684	10.2	"	24.398		13			10
Iron	11470	1270	"	11036		4			10
Potassium	3391.3	5080	"	3145.4		8			10
Magnesium	6850.4	1270	"	6818.6		0.5			10
Manganese	341.48	25.4	"	338.00		1			10
Sodium	< 1270	5080	"	< 254.00					10
Nickel	< 25.4	50.8	"	10.667					10
Lead	< 50.8	127	"	17.406					10
Antimony	< 254	508	"	< 50.80					10
Selenium	< 305	508	"	< 61.00					10
Thallium	< 102	102	"	< 20.40					10
Vanadium	< 50.8	254	"	11.505					10
Zinc	58.969	102	"	60.356		2			10
Strontium	58.622	50.8	"	57.121		3			10

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.

RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

**Project Name:** Utah Metal Smelter\_Soil\_APR 2014\_A032

**Certificate of Analysis:**

**TDF #:** A-032

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**DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method - Quality Control**

**TechLaw, Inc. - ESAT Region 8**

Analyte	Result	Det. Limit	Units	Spike Level	Source Result	%R	%R Limits	%D or RPD	%D or RPD Limit
<b>NIC MA-3000</b>									
Batch 1404045 - No Lab Prep Reqd									
<b>Soil</b>									
<b>NIC MA-3000</b>									
<b>Method Blank (1404045-BLK1)</b>				Dilution Factor: 1					Prepared: 04/29/14 Analyzed: 04/30/14
Mercury	< 0.010	0.020	mg/kg dry wt						
<b>Duplicate (1404045-DUP1)</b>				Dilution Factor: 1	Source: C140405-01				Prepared: 04/29/14 Analyzed: 04/30/14
Mercury	< 0.010	0.020	mg/kg dry wt		< 0.010				35
<b>Matrix Spike (1404045-MS1)</b>				Dilution Factor: 1	Source: C140405-01				Prepared: 04/29/14 Analyzed: 04/30/14
Mercury	0.2257	0.021	mg/kg dry wt	0.212	< 0.011	106	80-120		
<b>Matrix Spike Dup (1404045-MSD1)</b>				Dilution Factor: 1	Source: C140405-01				Prepared: 04/29/14 Analyzed: 04/30/14
Mercury	0.2239	0.021	mg/kg dry wt	0.206	< 0.010	109	80-120	0.8	20
<b>Reference (1404045-SRM1)</b>				Dilution Factor: 1					Prepared: 04/29/14 Analyzed: 04/30/14
Mercury	6.742	0.114	mg/kg dry wt	6.45		105	75-125		

NOTE: %R = % Recovery, %R limits do not apply when sample levels exceed 4x the spike level.  
RPD = Relative Percent Difference, %D = % Difference, DL = Detection Limit for QC sample

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

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**TechLaw Inc., ESAT Region 8**  
**INORGANIC ANALYSES DATA SHEET**  
**Initial and Continuing Calibration Blanks**

Analytical Method:	<u>EPA 200.2/200.7</u>	Analysis Name:	<u>ICPOE Tot. Rec. Metals</u>
Instrument:	<u>ICPOE - PE Optima</u>	Work Order: Nu	<u>C140405</u>
Analytical Sequence:	<u>1404038 Total Recoverable</u>	Concentration Units:	<u>mg/kg dry wt</u>

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
		1	2	3	4		
Silver	0.42	-0.02	0.04	0.31		1404035-BLK1	NA
		5	6	7	8		
						0.42	NA
Aluminum	3.48	1	2	3	4	1404035-BLK1	NA
		-2.11	5.66	11.10			
		5	6	7	8	-1.26	NA
Arsenic	-10.51	1	2	3	4	1404035-BLK1	NA
		3.91	-10.03	-2.50			
		5	6	7	8	3.84	NA
Barium	-0.03	1	2	3	4	1404035-BLK1	NA
		0.01	0.14	0.01			
		5	6	7	8	0.46	NA
Beryllium	0.05	1	2	3	4	1404035-BLK1	NA
		0.05	0.01	0.04			
		5	6	7	8	-0.04	NA
Calcium	0.94	1	2	3	4	1404035-BLK1	NA
		3.00	3.00	0.11			
		5	6	7	8	6.59	NA
Cadmium	0.05	1	2	3	4	1404035-BLK1	NA
		0.20	0.16	0.04			
		5	6	7	8	-0.07	NA
Cobalt	0.53	1	2	3	4	1404035-BLK1	NA
		0.25	0.01	0.19			
		5	6	7	8	-0.21	NA

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**TechLaw Inc., ESAT Region 8**  
**INORGANIC ANALYSES DATA SHEET**  
**Initial and Continuing Calibration Blanks**

Analytical Method:	<u>EPA 200.2/200.7</u>	Analysis Name:	<u>ICPOE Tot. Rec. Metals</u>
Instrument:	<u>ICPOE - PE Optima</u>	Work Order: Nu	<u>C140405</u>
Analytical Sequence:	<u>1404038 Total Recoverable</u>	Concentration Units:	<u>mg/kg dry wt</u>

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
		1	2	3	4		
Chromium	0.36	1	2	3	4	1404035-BLK1	NA
		0.56	0.72	0.65		0.48	NA
		5	6	7	8		
Copper	0.41	1	2	3	4	1404035-BLK1	NA
		0.50	0.54	0.36		0.57	NA
		5	6	7	8		
Iron	19.58	1	2	3	4	1404035-BLK1	NA
		95.01	72.10	58.71		102.45	NA
		5	6	7	8		
Potassium	110.31	1	2	3	4	1404035-BLK1	NA
		122.44	126.98	154.26		304.99	NA
		5	6	7	8		
Magnesium	0.30	1	2	3	4	1404035-BLK1	NA
		1.52	1.03	1.38		4.42	NA
		5	6	7	8		
Manganese	0.10	1	2	3	4	1404035-BLK1	NA
		0.08	0.13	0.18		-0.13	NA
		5	6	7	8		
Sodium	18.35	1	2	3	4	1404035-BLK1	NA
		10.07	9.75	14.20		137.79	NA
		5	6	7	8		
Nickel	1.37	1	2	3	4	1404035-BLK1	NA
		1.17	0.35	0.76		0.40	NA
		5	6	7	8		

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**TechLaw Inc., ESAT Region 8**  
**INORGANIC ANALYSES DATA SHEET**  
**Initial and Continuing Calibration Blanks**

Analytical Method:	<u>EPA 200.2/200.7</u>	Analysis Name:	<u>ICPOE Tot. Rec. Metals</u>
Instrument:	<u>ICPOE - PE Optima</u>	Work Order: Nu	<u>C140405</u>
Analytical Sequence:	<u>1404038</u> <b>Total Recoverable</b>	Concentration Units:	<u>mg/kg dry wt</u>

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)	PQL
		1	2	3	4		
Lead	-2.72	1	2	3	4	1404035-BLK1	NA
		-4.32	-2.41	-2.22		-1.05	2.50
		5	6	7	8		
Antimony	8.57	1	2	3	4	1404035-BLK1	NA
		22.64	21.53	24.27		3.35	10.00
		5	6	7	8		
Selenium	16.13	1	2	3	4	1404035-BLK1	NA
		15.36	17.61	19.81		28.35	10.00
		5	6	7	8		
Thallium	3.70	1	2	3	4	1404035-BLK1	NA
		7.31	4.32	5.32		1.71	2.00
		5	6	7	8		
Vanadium	0.38	1	2	3	4	1404035-BLK1	NA
		-0.85	-1.98	-1.75		-0.24	5.00
		5	6	7	8		
Zinc	-0.13	1	2	3	4	1404035-BLK1	NA
		1.12	0.46	0.63		0.08	2.00
		5	6	7	8		
Strontium	0.36	1	2	3	4	1404035-BLK1	NA
		0.26	0.17	0.20		0.18	1.00
		5	6	7	8		

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TechLaw Inc., ESAT Region 8

**INORGANIC ANALYSES DATA SHEET**

**Initial and Continuing Calibration Blanks**

Analytical Method: 7473

Analysis Name: TM\_Mercury 7473

Instrument: NIC MA-3000

Work Order: Nu C140405

Analytical Sequence: Total

Concentration Units: mg/kg dry wt

Blank criteria = +/- 5x analyte MDL (+/- PQL)

Analyte	Initial Calibration Blank (1 & 2)	Continuing Calibration Blanks				Method Blank (Batch ID)		PQL
		1	2	3	4	1404045-BLK1	NA	
Mercury		-0.76	-0.76	-1.89		-1.51	NA	0.02
		5	6	7	8			

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

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## TechLaw, Inc. - ESAT Region 8

## Initial and Continuing Calibration Verification Results

ICPOE - PE Optima	Method: EPA 200.2/200.7	Analysis Name: ICPOE Tot. Rec. Metals
Sequence: 1404038	Work Order: C140405	Units: mg/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Aluminum	12500 12755 102.0	1		2			3					
		12500	12634	101.1	12500	12538	100.3	12500	12648	101.2		
		4		5			6					
		7		8			9					
		1		2			3					
		2500	2461.3	98.5	2500	2460.0	98.4	2500	2469.0	98.8		
		4		5			6					
		7		8			9					
		1		2			3					
Antimony	2500 2467.2 98.7	2500	2558.8	102.4	2500	2570.4	102.8	2500	2571.8	102.9		
		4		5			6					
		7		8			9					
		1		2			3					
		500	505.01	101.0	500	501.35	100.3	500	507.84	101.6		
		4		5			6					
		7		8			9					
		1		2			3					
		500	514.80	103.0	500	515.64	103.1	500	516.57	103.3		
Beryllium	500 507.93 101.6	4		5			6					
		7		8			9					
		1		2			3					
		500	514.65	102.9	500	509.12	101.8	500	515.15	103.0		
		4		5			6					
		7		8			9					
		1		2			3					
		500	509.19	101.8	500	509.12	101.8	500	515.15	103.0		
		4		5			6					
		7		8			9					

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

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## TechLaw, Inc. - ESAT Region 8

## Initial and Continuing Calibration Verification Results

ICPOE - PE Optima	Method: EPA 200.2/200.7	Analysis Name: ICPOE Tot. Rec. Metals
Sequence: 1404038	Work Order: C140405	Units: mg/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Calcium	12500	12636	101.1	1			2			3		
				12500	12674	101.4	12500	12593	100.7	12500	12645	101.2
				4			5			6		
				7			8			9		
				1			2			3		
				2500	2532.8	101.3	2500	2511.0	100.4	2500	2538.3	101.5
				4			5			6		
				7			8			9		
				1			2			3		
Chromium	2500	2546.1	101.8	500	509.39	101.9	500	508.82	101.8	500	511.77	102.4
				4			5			6		
				7			8			9		
				1			2			3		
				1000	997.25	99.7	1000	998.11	99.8	1000	1003.1	100.3
				4			5			6		
				7			8			9		
				1			2			3		
				12500	12863	102.9	12500	12802	102.4	12500	12824	102.6
Iron	12500	12900	103.2	4			5			6		
				7			8			9		
				1			2			3		
				2500	2547.4	101.9	2500	2543.2	101.7	2500	2564.7	102.6
				4			5			6		
				7			8			9		
				1			2			3		
				2500	2521.1	100.8	2500	2518.2	100.6	2500	2546.7	102.6
				4			5			6		

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

Certificate of Analysis:

TDF #: A-032

Preliminary Report

**TechLaw, Inc. - ESAT Region 8****Initial and Continuing Calibration Verification Results**

ICPOE - PE Optima

Method: EPA 200.2/200.7

Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1404038

Work Order: C140405

Units: mg/kg dry wt

Total Recoverable Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Magnesium	12500	12813	102.5	1			2			3		
				12500	12749	102.0	12500	12611	100.9	12500	12665	101.3
				4			5			6		
				7			8			9		
				1			2			3		
				1000	1031.8	103.2	1000	1028.1	102.8	1000	1034.3	103.4
				4			5			6		
				7			8			9		
				1			2			3		
Nickel	2500	2545.7	101.8	2500	2592.3	103.7	2500	2573.1	102.9	2500	2589.1	103.6
				4			5			6		
				7			8			9		
				1			2			3		
				25000	25169	100.7	25000	25000	100.0	25000	25239	101.0
				4			5			6		
				7			8			9		
				1			2			3		
				2500	2576.5	103.1	2500	2543.1	101.7	2500	2566.9	102.7
Selenium	2500	2534.1	101.4	4			5			6		
				7			8			9		
				1			2			3		
				2500	2576.5	103.1	2500	2543.1	101.7	2500	2566.9	102.7
				4			5			6		
				7			8			9		
				1			2			3		
				250	257.97	103.2	250	257.41	103.0	250	258.33	103.3
				4			5			6		
Silver	250	256.84	102.7	7			8			9		

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

**Certificate of Analysis:  
Preliminary Report**

**TechLaw, Inc. - ESAT Region 8**

**Initial and Continuing Calibration Verification Results**

ICPOE - PE Optima

Method: EPA 200.2/200.7

Analysis Name: ICPOE Tot. Rec. Metals

Sequence: 1404038

Work Order: C140405

Units: mg/kg dry wt

<b>Total Recoverable Analyte</b>	<b>Initial (ICV1, ICV2)</b>			<b>Continuing Calibration Verification Standards (CCVs)</b>								
	<b>True</b>	<b>Found</b>	<b>%R</b>	<b>True</b>	<b>Found</b>	<b>%R</b>	<b>True</b>	<b>Found</b>	<b>%R</b>	<b>True</b>	<b>Found</b>	<b>%R</b>
<b>Sodium</b>	12500 12802 102.4	1		12500	12693	101.5	12500	12631	101.0	12500	12751	102.0
		2					2			3		
		4					5			6		
		7					8			9		
		1		500	503.96	100.8	500	506.92	101.4	500	507.91	101.6
		2					5			6		
		4					5			6		
		7					8			9		
<b>Strontium</b>	500 503.32 100.7	1		2500	2545.1	101.8	2500	2534.5	101.4	2500	2548.9	102.0
		2					2			3		
		4					5			6		
		7					8			9		
		1		1000	1008.1	100.8	1000	1001.8	100.2	1000	1011.7	101.2
		2					5			6		
		4					5			6		
		7					8			9		
<b>Thallium</b>	2500 2524.5 101.0	1		2500	2627.2	105.1	2500	2600.3	104.0	2500	2614.9	104.6
		2					2			3		
		4					5			6		
		7					8			9		
		1		1000	1008.1	100.8	1000	1001.8	100.2	1000	1011.7	101.2
		2					5			6		
		4					5			6		
		7					8			9		
<b>Vanadium</b>	1000 1008.8 100.9	1		2500	2627.2	105.1	2500	2600.3	104.0	2500	2614.9	104.6
		2					2			3		
		4					5			6		
		7					8			9		
		1		2500	2627.2	105.1	2500	2600.3	104.0	2500	2614.9	104.6
		2					5			6		
		4					5			6		
		7					8			9		
<b>Zinc</b>	2500 2547.2 101.9	1		2500	2627.2	105.1	2500	2600.3	104.0	2500	2614.9	104.6
		2					2			3		
		4					5			6		
		7					8			9		
		1		2500	2627.2	105.1	2500	2600.3	104.0	2500	2614.9	104.6
		2					5			6		
		4					5			6		
		7					8			9		

Metals - ICV &amp; CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

Certificate of Analysis:  
Preliminary Report

TechLaw, Inc. - ESAT Region 8

Initial and Continuing Calibration Verification Results

NIC MA-3000

Method: 7473

Analysis Name: TM\_Mercury 7473

Sequence: 1404054

Work Order: C140405

Units: mg/kg dry wt

Total Analyte	Initial (ICV1, ICV2)			Continuing Calibration Verification Standards (CCVs)								
	True	Found	%R	True	Found	%R	True	Found	%R	True	Found	%R
Mercury	100	107.8	107.8	1			2			3		
				100	101.4	101.4	100	101.0	101.0	100	100.6	100.6
				4			5			6		
				7			8			9		

Metals - ICV & CCV %R Criteria = 90 - 110%, Classical Chemistry %R Criteria - ICV = 90 - 110%R, CCV = 80 - 120%R.

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032  
TDF #: A-032

Certificate of Analysis:  
Preliminary Report

TechLaw, Inc. - ESAT Region 8  
ICP Interference Check Sample  
ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1404038	Analysis: ICPOE Tot. Rec. Metals					
Aluminum	IFA1	59,406.4	ug/L	60,000	99	50.0
	IFB1	60,339.2	ug/L	60,000	101	50.0
Antimony	IFA1	7.2	ug/L		100	
	IFB1	973.4	ug/L	1,000	97	100
Arsenic	IFA1	12.1	ug/L		100	
	IFB1	1,053.1	ug/L	1,000	105	100
Barium	IFA1	-4.5	ug/L		5.00	
	IFB1	291.9	ug/L	300	97	5.00
Beryllium	IFA1	-0.9	ug/L		5.00	
	IFB1	97.4	ug/L	100	97	5.00
Cadmium	IFA1	3.3	ug/L		5.00	
	IFB1	302.0	ug/L	300	101	5.00
Calcium	IFA1	292,088.9	ug/L	300,000	97	250
	IFB1	295,184.3	ug/L	300,000	98	250
Chromium	IFA1	0.9	ug/L		5.00	
	IFB1	298.6	ug/L	300	100	5.00
Cobalt	IFA1	3.9	ug/L		5.00	
	IFB1	302.9	ug/L	300	101	5.00
Copper	IFA1	1.5	ug/L		2.00	
	IFB1	311.1	ug/L	300	104	2.00
Iron	IFA1	244,199.7	ug/L	250,000	98	250
	IFB1	245,533.8	ug/L	250,000	98	250
Lead	IFA1	5.5	ug/L		25.0	
	IFB1	1,018.3	ug/L	1,000	102	25.0
Magnesium	IFA1	140,800.7	ug/L	150,000	94	250
	IFB1	142,641.9	ug/L	150,000	95	250
Manganese	IFA1	-0.6	ug/L		5.00	
	IFB1	197.7	ug/L	200	99	5.00
Nickel	IFA1	-3.3	ug/L		10.0	
	IFB1	294.5	ug/L	300	98	10.0
Potassium	IFA1	4.1	ug/L		1000	
	IFB1	21,164.6	ug/L	20,000	106	1000
Selenium	IFA1	4.5	ug/L		100	
	IFB1	544.5	ug/L	500	109	100

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

Certificate of Analysis:  
Preliminary Report

TechLaw, Inc. - ESAT Region 8  
ICP Interference Check Sample  
ICPOE - PE Optima

Analyte	Check Sample	Result*	Units	True	%R	PQL
Sequence: 1404038	Analysis: ICPOE Tot. Rec. Metals					
Silver	IFA1	10.1	ug/L			10.0
	IFB1	323.9	ug/L	300	108	10.0
Sodium	IFA1	51,236.3	ug/L	50,000	102	1000
	IFB1	51,697.2	ug/L	50,000	103	1000
Strontium	IFA1	-2.0	ug/L			10.0
	IFB1	1,007.8	ug/L	1,000	101	10.0
Thallium	IFA1	9.2	ug/L			20.0
	IFB1	1,007.4	ug/L	1,000	101	20.0
Vanadium	IFA1	-8.2	ug/L			50.0
	IFB1	292.5	ug/L	300	97	50.0
Zinc	IFA1	3.0	ug/L			20.0
	IFB1	296.9	ug/L	300	99	20.0

\*Criteria = 80-120%R of True Value or +/- PQL

See raw data for complete analyte list and results.

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

**Certificate of Analysis:  
Preliminary Report**

**TechLaw, Inc. - ESAT Region 8  
Detection Limit (PQL) Standard  
NIC MA-3000**

DRAFT: Mercury only (Total) by EPA 245.1 / 7470A Method

Sequence: 1404054

<u>Analyte</u>	<u>True</u>	<u>Found</u>	<u>%R</u>	<u>Units</u>
Mercury	100	9.833	10	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

Certificate of Analysis:  
Preliminary Report

**TechLaw, Inc. - ESAT Region 8**  
**Detection Limit (PQL) Standard**  
**ICPOE - PE Optima**

DRAFT: Metals (Total Recov) by EPA 200/7000 Series Methods

Sequence: 1404038

<u>Analyte</u>	<u>True</u>	<u>Found</u>	<u>%R</u>	<u>Units</u>
Aluminum	100	90.288	90	ug/L
Antimony	50.0	36.773	74	ug/L
Arsenic	50.0	43.948	88	ug/L
Barium	10.0	9.9608	100	ug/L
Beryllium	5.00	4.8408	97	ug/L
Cadmium	10.0	10.352	104	ug/L
Calcium	250	245.33	98	ug/L
Chromium	10.0	9.2739	93	ug/L
Cobalt	10.0	10.794	108	ug/L
Copper	10.0	9.5022	95	ug/L
Iron	100	151.51	152	ug/L
Lead	30.0	26.892	90	ug/L
Magnesium	1000	1004.2	100	ug/L
Manganese	10.0	10.127	101	ug/L
Nickel	10.0	10.699	107	ug/L
Potassium	1000	1067.4	107	ug/L
Selenium	100	122.90	123	ug/L
Silver	10.0	9.8379	98	ug/L
Sodium	1000	998.69	100	ug/L
Strontium	10.0	10.258	103	ug/L
Thallium	50.0	57.111	114	ug/L
Vanadium	50.0	49.225	98	ug/L
Zinc	50.0	53.075	106	ug/L

Recovery Control Limits: 70-130% except Pb, Tl, Sb, & Hg at 50-150%. No limits for Al, Ca, Fe, K, Mg & Na.

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

Certificate of Analysis:  
Preliminary Report

TechLaw Inc., ESAT Region 8

INSTRUMENT ANALYSIS SEQUENCE LOG

Analytical Method: EPA 200.2/200.7

Total Recoverable

Sequence ID#: 1404038

Instrument ID #: ICPOE - PE Optima

Soil

LSR #: DRAFT A-032

Analysis ID	Sample Name	Analysis Date	Analysis Time
1404038-ICV1	Initial Cal Check	04/24/14	08:43
1404038-SCV1	Secondary Cal Check	04/24/14	08:46
1404038-ICB1	Initial Cal Blank	04/24/14	08:49
1404038-CRL1	Instrument RL Check	04/24/14	08:52
1404038-IFA1	Interference Check A	04/24/14	08:55
1404038-IFB1	Interference Check B	04/24/14	08:59
1404035-BLK1	Blank	04/24/14	09:03
1404035-SRM1	Reference	04/24/14	09:06
C140405-01	DRAFT: USZ03D03_041414	04/24/14	09:09
1404035-DUP1	Duplicate	04/24/14	09:12
1404038-SRD1	Serial Dilution	04/24/14	09:15
1404035-MS1	Matrix Spike	04/24/14	09:18
C140405-02	DRAFT: USZ04D02_041414	04/24/14	09:21
1404035-MS3	Matrix Spike	04/24/14	09:24
C140405-03	DRAFT: USZ05D01_041414	04/24/14	09:28
1404038-CCV1	Calibration Check	04/24/14	09:34
1404038-CCB1	Calibration Blank	04/24/14	09:37
C140405-04	DRAFT: USZ06D02_041414	04/24/14	09:40
C140405-05	DRAFT: USZ06D03_041414	04/24/14	09:43
C140405-06	DRAFT: USZ11D01_041514	04/24/14	09:46
C140405-07	DRAFT: USZ12D02_041514	04/24/14	09:49
C140405-08	DRAFT: USZ13D02_041614	04/24/14	09:53
C140405-09	DRAFT: USZ14D01_041514	04/24/14	09:56
C140405-10	DRAFT: USZ14D02_041514	04/24/14	09:59
C140405-11	DRAFT: USZ14D03_041514	04/24/14	10:02
C140405-12	DRAFT: USZ17D02_041514	04/24/14	10:05
1404038-CCV2	Calibration Check	04/24/14	10:11
1404038-CCB2	Calibration Blank	04/24/14	10:14
C140405-13	DRAFT: USZ18D02_041414	04/24/14	10:17
C140405-14	DRAFT: USZ19D01_041614	04/24/14	10:20
C140405-15	DRAFT: USZ21D01_041414	04/24/14	10:24
C140405-16	DRAFT: USZ21D02_041414	04/24/14	10:27
C140405-17	DRAFT: USZ21D03_041414	04/24/14	10:30
C140405-18	DRAFT: USZ23D01_041514	04/24/14	10:33
C140405-19	DRAFT: USZ23D02_041514	04/24/14	10:36
C140405-20	DRAFT: USZ23D03_041514	04/24/14	10:39
1404038-CCV3	Calibration Check	04/24/14	10:45
1404038-CCB3	Calibration Blank	04/24/14	10:48

Project Name: Utah Metal Smelter\_Soil\_APR 2014\_A032

TDF #: A-032

Certificate of Analysis:  
Preliminary Report

**TechLaw Inc., ESAT Region 8**

**INSTRUMENT ANALYSIS SEQUENCE LOG**

Analytical Method: 7473 Total Sequence ID#: 1404054

Instrument ID #: NIC MA-3000

Soil

LSR #: DRAFT A-032

Analysis ID	Sample Name	Analysis Date	Analysis Time
1404054-ICV1	Initial Cal Check	04/30/14	14:58
1404054-CRL1	Instrument RL Check	04/30/14	14:58
1404045-BLK1	Blank	04/30/14	14:58
1404045-SRM1	Reference	04/30/14	14:58
C140405-01	DRAFT: USZ03D03_041414	04/30/14	14:58
1404045-DUP1	Duplicate	04/30/14	14:58
1404045-MS1	Matrix Spike	04/30/14	14:58
1404045-MSD1	Matrix Spike Dup	04/30/14	14:58
C140405-02	DRAFT: USZ04D02_041414	04/30/14	14:58
C140405-03	DRAFT: USZ05D01_041414	04/30/14	14:58
C140405-04	DRAFT: USZ06D02_041414	04/30/14	14:58
1404054-CCV1	Calibration Check	04/30/14	14:58
1404054-CCB1	Calibration Blank	04/30/14	14:58
C140405-05	DRAFT: USZ06D03_041414	04/30/14	14:58
C140405-07	DRAFT: USZ12D02_041514	04/30/14	14:58
C140405-08	DRAFT: USZ13D02_041614	04/30/14	14:58
C140405-09	DRAFT: USZ14D01_041514	04/30/14	14:58
C140405-10	DRAFT: USZ14D02_041514	04/30/14	14:58
C140405-11	DRAFT: USZ14D03_041514	04/30/14	14:58
C140405-12	DRAFT: USZ17D02_041514	04/30/14	14:58
C140405-13	DRAFT: USZ18D02_041414	04/30/14	14:58
C140405-14	DRAFT: USZ19D01_041614	04/30/14	14:58
1404054-CCV2	Calibration Check	04/30/14	14:58
1404054-CCB2	Calibration Blank	04/30/14	14:58
C140405-15	DRAFT: USZ21D01_041414	04/30/14	14:58
C140405-16	DRAFT: USZ21D02_041414	04/30/14	14:58
C140405-17	DRAFT: USZ21D03_041414	04/30/14	14:58
C140405-18	DRAFT: USZ23D01_041514	04/30/14	14:58
C140405-19	DRAFT: USZ23D02_041514	04/30/14	14:58
C140405-20	DRAFT: USZ23D03_041514	04/30/14	14:58
C140405-06	DRAFT: USZ11D01_041514	04/30/14	14:58
1404054-CCV3	Calibration Check	04/30/14	14:58
1404054-CCB3	Calibration Blank	04/30/14	14:58

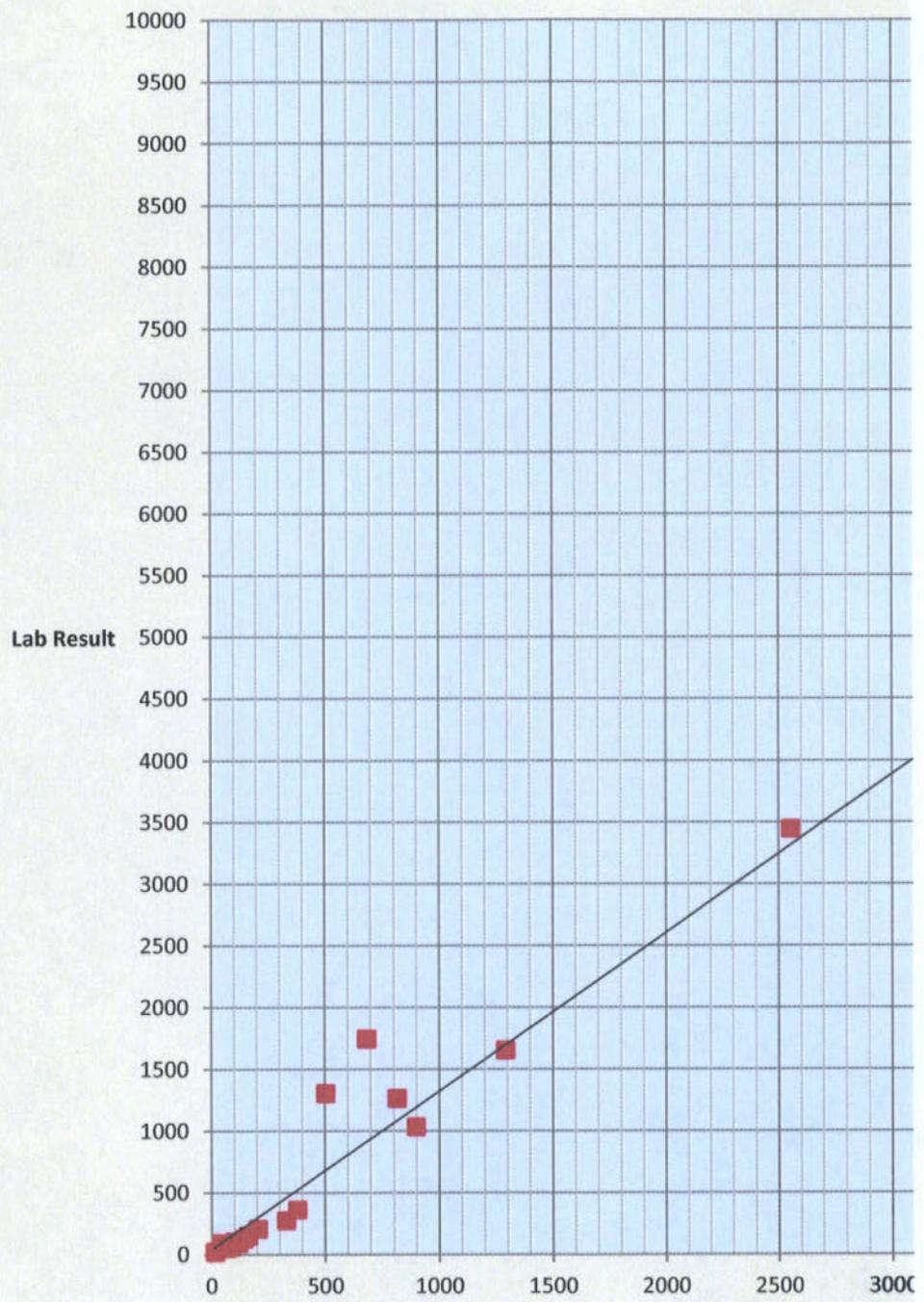
Samp_No	Result (mg/Kg)	lab result (mg/Kg)	RPD (%)
USZ03D03_041414	12	17.4	36.7
USZ04D02_041414	40	87.8	74.8
USZ14D03_041514	63	47.2	28.7
USZ13D02_041614	78	59.1	27.6
USZ05D01_041414	99	99.1	0.1
USZ19D01_041614	109	93.2	15.6
USZ17D02_041514	115	89.2	25.3
USZ12D02_041514	140	123	12.9
USZ18D02_041414	159	148	7.2
USZ14D02_041514	202	202	0.0
USZ14D01_041514	326	271	18.4
USZ11D01_041514	375	358	4.6
USZ06D02_041414	500	1300	88.9
USZ06D03_041414	680	1740	87.6
USZ23D02_041514	813	1260	43.1
USZ23D03_041514	896	1030	13.9
USZ23D01_041514	1289	1650	24.6
USZ21D03_041414	2550	3440	29.7
USZ21D01_041414	3718	4140	10.7
USZ21D02_041414	6981	9220	27.6

RPD = Relative Precent Difference

$$\text{RPD Formula} = \frac{|x_1 - x_2| * 100}{(x_1 + x_2)/2}$$

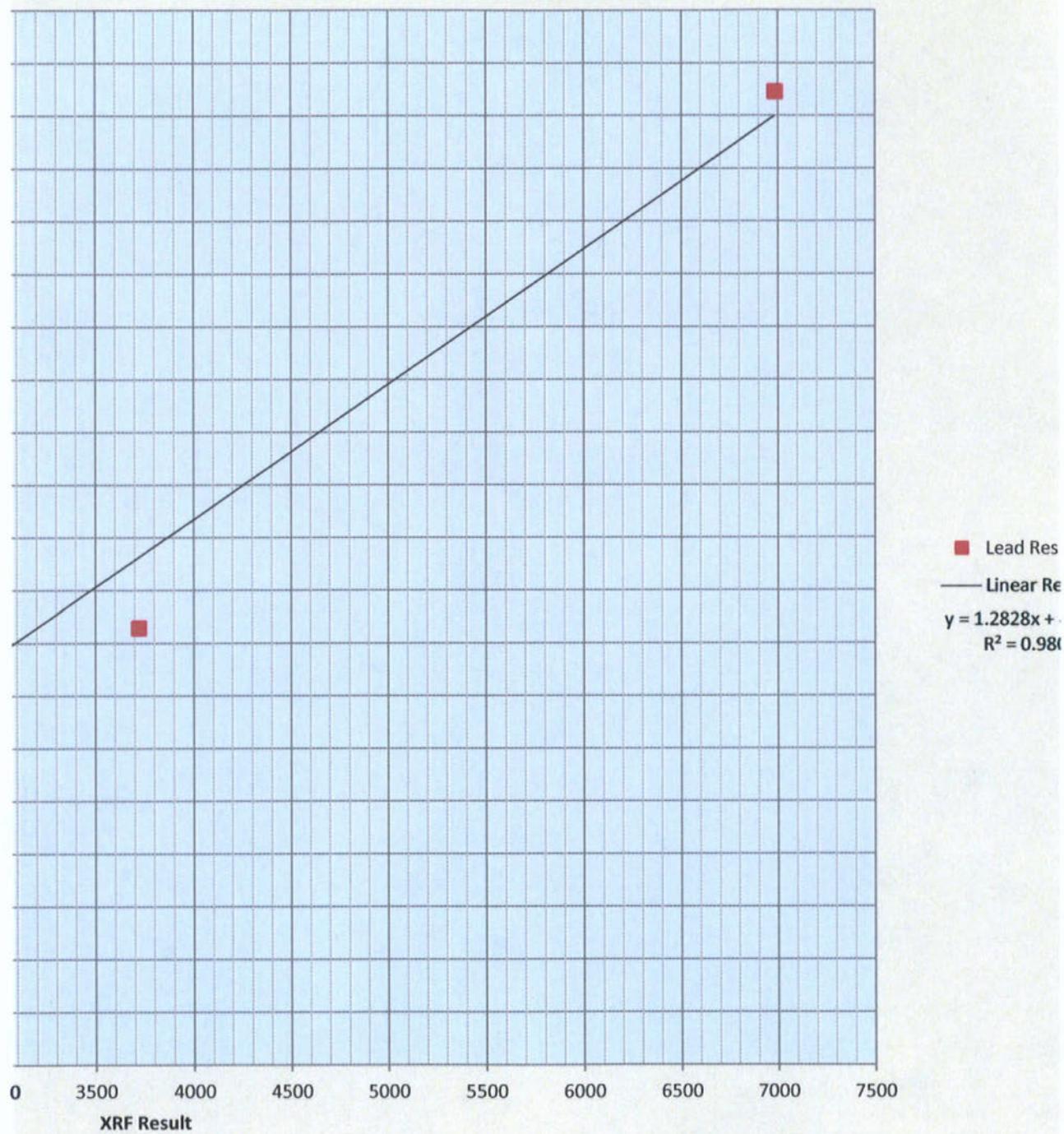
mg/Kg - milligrams per kilogram or ppm - parts per million

## Utah Metal Lead



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## Correlation - Lab Results vs XRF



sults

egression

40.769

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